GE Energy
Industrial Solutions

WORLDWIDE PARTNER

Control and Automation

For industrial applications ED.03

Speed drive units VAT20, VAT200, VAT300

GE imagination at work

GE – Global

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Innovation has always been the foundation of our past and the key to our future contributions. GE plays a vital role in our modern world by making extraordinary ideas, a natural part of everybody's life. We are committed to anticipate and meet changing needs and represent imagination in a manner that reflects our principles. We take pride in delivering quality and value to our customers day after day.

GE Energy – Industrial Solutions, India

GE Energy – Industrial Solutions, India offers innovative solutions to meet customer needs in Power & Protection. The company has a pan India presence, with 4 regional offices, 13 sales offices and manufacturing plant at Bangalore.

GE Energy – Industrial Solutions, offers solutions and products to customers in several segments that include power sector, core infrastructure like marine establishments, airports, highways, heavy and light Industries, IT & ITES infrastructure, healthcare, commercial and residential segments.

The India Innovation Center

The India Innovation Center (IIC) is a dedicated engineering research & design IT development center for the global GE Energy – Industrial Solutions business. Established in 1999, IIC today is amongst the largest design and development centers for GE Energy – Industrial Solutions business. IIC employs more than 1000 engineers and IT professionals working with teams across the globe.

About the Technology Team

The Technology teams at IIC develop new products and solutions for the global market in the areas of Circuit Breakers, Motors, Power Quality and Protection, Electrical Machines, Industrial Automation, Sensing Systems.

FORTUNE 2009 WORLD'S MOST ADMIRED COMPANIES Industry Champion -- Ranked #1
2009 America's and World's Most Admired Companies

BusinessWeek
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FINANCIAL TIMES
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World's Best R&D COMPANIES
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2007 World's Best R&D Companies

H.2 VAT20 - Micro AC variable speed drives

Order codes

I/O terminal board specifications

I/O wiring

Dimensions and weights

H.8 VAT200 - Mini AC variable speed drives

Order codes

Technical data

I/O Power & control layout

I/O Control terminal description

External accessories

EMC compliance

Dimensions

H.18 VAT300 - Advanced general purpose AC drive

Order codes

Optional interfaces and accessories

Technical data

I/O wiring basic scheme

I/O terminal board specifications

External accessories

Dimensions and weights

Micro AC variable speed drives

- Single-phase or three-phase digital inverters for controlling the speed of three-phase induction AC motors from 0.2 to 2.2kW
- Built-in keypad and display
- IP20 or IP65 protection degree
- Built-in EMC filter for industrial environment (class A)
- DIN rail mountable by optional kit
- Global standards CE and cUL

Technical data

Control specifications

Control system	Sinusoidal wave PWM inverter
Output frequency	0 - 200Hz
Voltage / Frequency	Constant torque, Constant power, Torque boost
	Six selectable pre-set patterns
Overload capacity	150%, 60 sec.
Carrier frequency	Selectable 4 - 16kHz
Frequency setting resolution	
Digital	0.1Hz(0-99.9Hz), 1Hz(100-200Hz)
Analogic	0.1Hz/ 60Hz
Acceleration/deceleration	0.1 - 999 sec.
	Acceleration and deceleration set individually
Operating system	Two mode selection: forward run by FWD input, Reverse run by REV
	input Run by FWD input, forward/reverse command by REV input
Stopping system	Selectable either ramp down or coast to stop
DC breaking	DC break starting frequency 1-10Hz
	DC breaking level 0-20%, DC braking time 0-25.5s
Frequency limit	Upper limit (1-200Hz), lower limit (0-200Hz)
Other functions	Auto re-start, Auto reset, Flying start, Jog Slow speeds

I/O configuration

Operation panel	3 digits, 7 segment display with 5 operation keys
Sequence input	Four digital inputs (2 are programmable)
Sequence output	One programmable relay output
Frequency setting input	One analogue either 0-10V, 4-20mA or 0-20mA configurable
Source for potentiometer	10VDC source for 2-10kΩ potentiometer
Analogue outputs	0-10VDC for frequency output display

Protection features

Prevention	Overcurrent limitation, Overvoltage limitation, Stall prevention
Trip	Overload, Overvoltage, Undervoltage, Overcurrent, Powerloss,
	Output short-circuit, Grounding fault, Overtemperature
Fault history	The last three faults are recorded

Operating environment

Installation	Indoor, with atmosphere free from corrosive or explosive gases, dust, steam or oil mist.
Protection degree	IP20 and IP65
Temperature range	From -10 to 50 °C
Relative humidity	0-95% without condensation
Vibrations	Under 1G (9.8 m/s^2)
Standards	cUL, CE

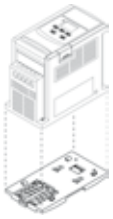
1 phase and 3 phase speed drives

Input voltage + 10%, -15%, 50/60 Hz (± 5%)	Input power kVA	Output current A	Max. motor power kW (1)	Cooling convection	Losses W	Protection degree	Cat. no.	Ref. no.	Pack
1ph 200V - 240V	0.53	1.4	0.2	natural	21	IP20	**U20N0K2S**	167075	1
	0.88	2.3	0.4	forced	38	IP20	**U20N0K4S**	167076	1
	1.6	4.2	0.75	forced	60	IP20	**U20N0K7S**	167077	1
1ph / 3ph 200V - 240V	2.9	7.5	1.5	forced	103	IP20	**U20N1K5S** (2)	167078	1
	4.0	10.5	2.2	forced	149	IP20	**U20N2K2S** (2)	167079	1
3ph 380V - 480V	1.6	2.3	0.75	forced	61	IP20	**U20X0K7S** (2)	167080	1
	2.9	3.8	1.5	forced	79	IP20	**U20X1K5S** (2)	167081	1
	4.0	5.2	2.2	forced	94	IP20	**U20X2K2S** (2)	167082	1
1ph 200V - 240V	0.53	1.4	0.2	natural	21	IP65	**U20N0K2P** (3)	167088	1
	0.88	2.3	0.4	natural	38	IP65	**U20N0K4P** (3)	167089	1
	1.6	4.2	0.75	natural	60	IP65	**U20N0K7P** (3)	167090	1
	0.53	1.4	0.2	natural	21	IP65	**U20N0K2PS** (4)	167132	1
	0.88	2.3	0.4	natural	38	IP65	**U20N0K4PS** (4)	167133	1
	1.6	4.2	0.75	natural	60	IP65	**U20N0K7PS** (4)	167134	1
1ph / 3ph 200V - 240V	2.9	7.5	1.5	natural	103	IP65	**U20N1K5P** (3)	167091	1
	4.0	10.5	2.2	natural	149	IP65	**U20N2K2P** (3)	167092	1
	2.9	7.5	1.5	natural	103	IP65	**U20N1K5PS** (4)	167135	1
	4.0	10.5	2.2	natural	149	IP65	**U20N2K2PS** (4)	167136	1
3ph 380V - 480V	1.6	2.3	0.75	natural	61	IP65	**U20X0K7P** (3)	167093	1
	2.9	3.8	1.5	natural	79	IP65	**U20X1K5P** (3)	167094	1
	4,0	5.2	2.2	natural	94	IP65	**U20X2K2P** (3)	167095	1
	1.6	2.3	0.75	natural	61	IP65	**U20X0K7PS** (4)	167137	1
	2.9	3.8	1.5	natural	79	IP65	**U20X1K5PS** (4)	167138	1
	4.0	5.2	2.2	natural	94	IP65	**U20X2K2PS** (4)	167139	1

(1) Ratings for standard tree-pole induction motors with four poles.
(2) Units including dynamic breaking function. An external braking resistor is needed to perform operation.
(3) IP65 models type U20_ _ P include only keypad in the front cover.
(4) IP65 models type U20_ _ PS include power switch, forward/reverse switch and potentiometer in the front cover.

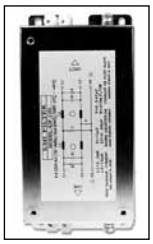
Options and accessories

DIN rail kit



	Applicable to drive	Cat. no.	Ref. no.	Pack
	All drives	**U20AR0K7** (pack of 10 pieces)	167087	1

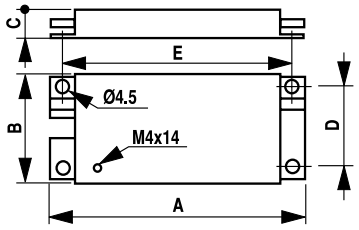
EMC filters



	Applicable to drive	Cat. no.	Ref. no.	Pack
	U20N0K2S U20N0K4S U20N0K7S	**U20AF0K7**	167085	1
	U20N1K5S U20N2K2S	**U20AF2K2**	167086	1
	U20X0K7S U20X1K5S U20X2K2S	**U20AF2K2X**	167084	1

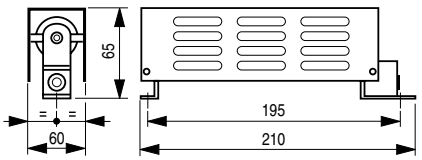
VAT 20 includes as standard a Class A EMC filter, for industrial environment.
For residential environment, the use of external Class B EMC foot print filter is recommended.

Cat. No.	A	B	C	D	E
U20AF0K7	156	76	25	60	145
U20AF2K2	170	221	38	108	156
U20AF2K2X	170	221	38	108	156



Breaking resistors
100% breaking torque, 10% ED

	Motor (kW)	Applicable to drive	Cat. no.	Ref. no.	Pack
	1.5	U20N1K5	**TLR100P200**	108223	1
	2.2	U20N2K2	**TLR75P200**	116300	1
	0.75	U20X0K7	**TLR750P200**	116301	1
	1.5	U20X1K5	**TLR400P200**	116302	1
	2.2	U20X2K2	**TLR250P200**	108227	1



Reactors

	Losses (W)	Applicable to drive	Cat. no.	Ref. no.	Pack
Input reactors for single phase drives	2.5	U20N0K2S	**ACRP3A7H0**	168490	1
	5	U20N0K4S	**ACRP8A2H5**	168491	1
	7	U20N0K7S	**ACRP12A2H5**	168492	1
	7.5	U20N1K5S	**ACRP18A1H3**	168493	1
	8	U20N2K2S	**ACRP22A0H84**	168494	1
Input reactors for three phase drives	11	U20N1K5S	**ACRP6A2H5**	168496	1
	14	U20N2K2S	**ACRP9A1H3**	168497	1
	8	U20X0K7S	**ACRP3A8H1**	168509	1
	9	U20X1K5S	**ACRP4A5H1**	168510	1
	11	U20X2K2S	**ACRP6A3H4**	168511	1

Cat.No.	Losses W	Fig.	A	B	C	D	E	Ø	Weight (kg)
ACRP3A7H0	2.4	4	75	96	85	80	56	6	1.3
ACRP8A2H5	5.2	4	75	96	100	80	56	6	1.8
ACRP12A2H5	6.8	4	84	102	110	86	65	6	2.7
ACRP18A1H3	7.3	4	96	112	106	96	77	6	3.2
ACRP22A0H84	8	4	96	112	116	96	77	6	3.7
ACRP6A2H5	17	1	120	80	152	41	100	6	1.5
ACRP9A1H3	18	1	120	80	152	41	100	6	1.6
ACRP3A8H1	17	1	120	80	152	41	100	6	1.4
ACRP4A5H1	16	1	120	80	152	41	100	6	1.5
ACRP6A3H4	19	1	120	80	152	41	100	6	1.7

Fig. 4

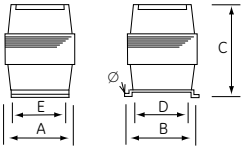
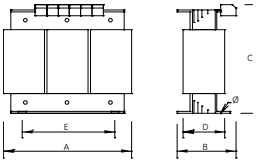


Fig. 1



Dimensions in mm

I/O terminal board specifications

Digital inputs

Symbol	Description	Function
12V	Common digital inputs	12V DC supply for all digital inputs
FWD	Forward run	Used for forward run command
REV	Reverse run	Used for reverse run command
SP1	Multifunction input	This is a programmable digital input Either jog, slow speed, emergency stop, output shut off or reset function are allowed
RST	Fault reset	This is a programmable input set to reset function as default Either jog, slow speed, emergency and output shut off are allowed as well

Digital outputs

Trip relay	Multifunction output	This is a programmable output relay set to fault function as default
1 , 2		Run status and frequency reached are allowed as well

Analogue inputs

MVI	Frequency setting	Programmable analogue frequency signal input 0-10V, 4-20mA or 0-20mA allowed
0V	Common analogue I/O	

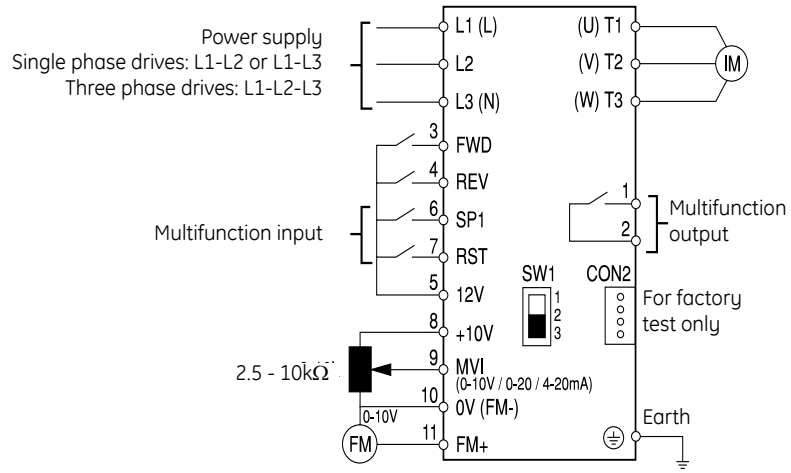
Analogue outputs

FM	Frequency output	Analogue output 0-10V. May be used as speed meter
0V	Common analogue I/O	

Other

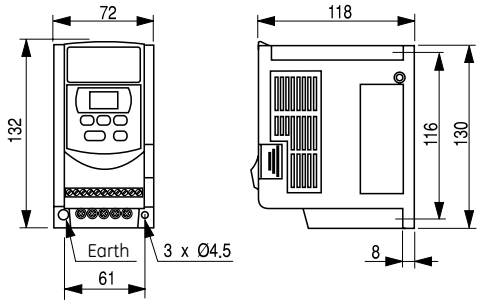
+10V	10V DC source	10V DC power supply for potentiometer 2-10KΩ (2W)

I/O wiring



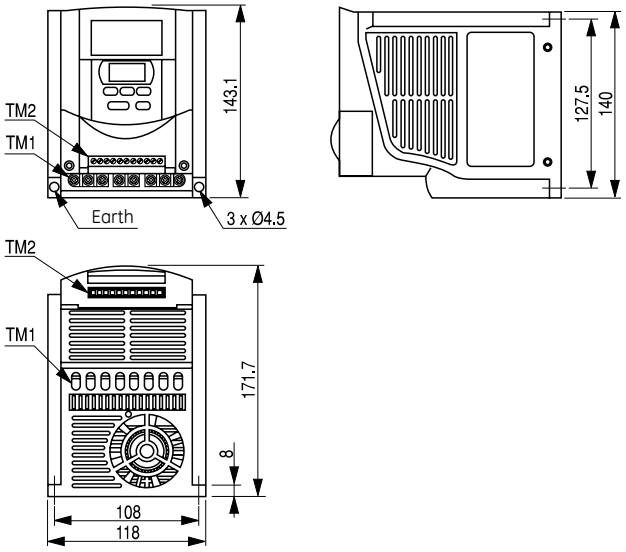
Dimensional drawings

Protection IP20



Cat. no.	Ref. no.	Weight (kg)
U20N0K2S	167075	0.76
U20N0K4S	167076	0.77
U20N0K7S	167077	0.8

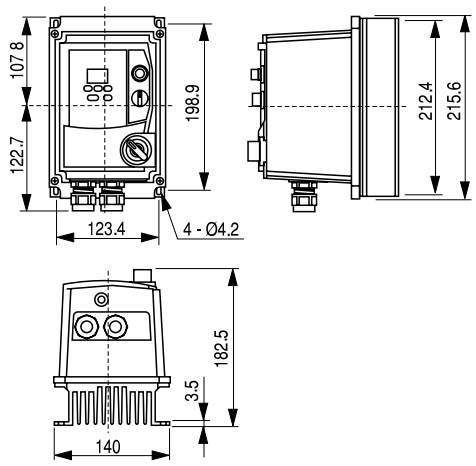
Dimensions in mm



Cat. no.	Ref. no.	Weight (kg)
U20N1K5S	167078	1.66
U20N2K2S	167079	1.76
U20X0K7S	167080	1.60
U20X1K5S	167081	1.60
U20X2K2S	167082	1.63

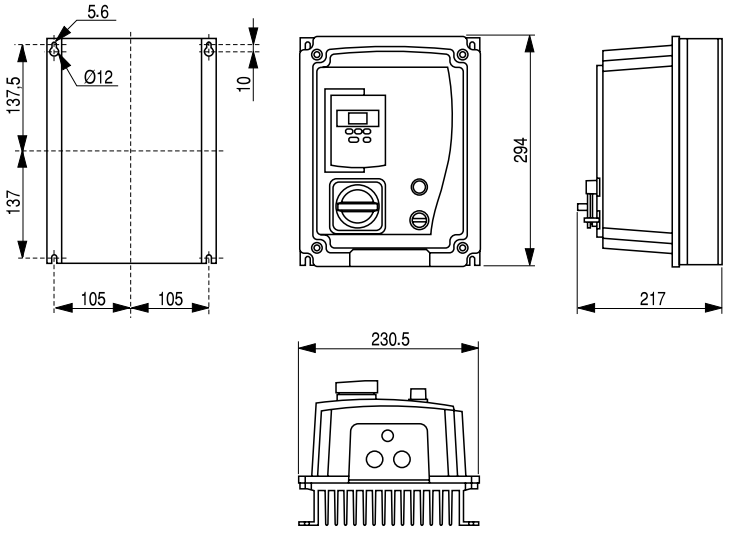
Dimensions in mm

Protection IP65



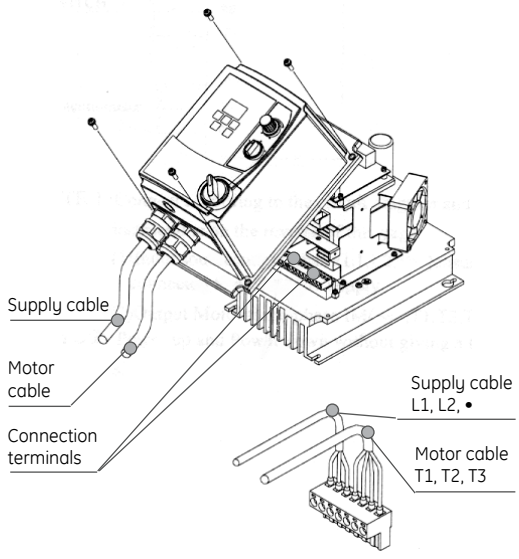
Cat. no.	Ref. no.	Weight (kg)
U20N0K2P	167088	2.9
U20N0K4P	167089	2.9
U20N0K7P	167090	2.9
U20N0K2PS	167132	2.9
U20N0K4PS	167133	2.9
U20N0K7PS	167134	2.9

Dimensions in mm



Cat. no.	Ref. no.	Weight (kg)
U20N1K5P	167091	4.8
U20N2K2P	167092	4.9
U20X0K7P	167093	4.9
U20X1K5P	167094	4.9
U20X2K2P	167095	4.9
U20N1K5PS	167135	5.2
U20N2K2PS	167136	5.3
U20X0K7PS	167137	5.2
U20X1K5PS	167138	5.2
U20X2K2PS	167139	5.2

Dimensions in mm



Mini AC variable speed drives

The VAT200 is a well performed, sensorless vector VSD for AC standard motors available in the following ranges:

- From 0.4 to 2.2 kW at 200V, single phase power supply
- From 0.4 to 7.5 kW at 200V, three phase power supply
- From 0.75 to 55 kW at 400V, three phase power supply

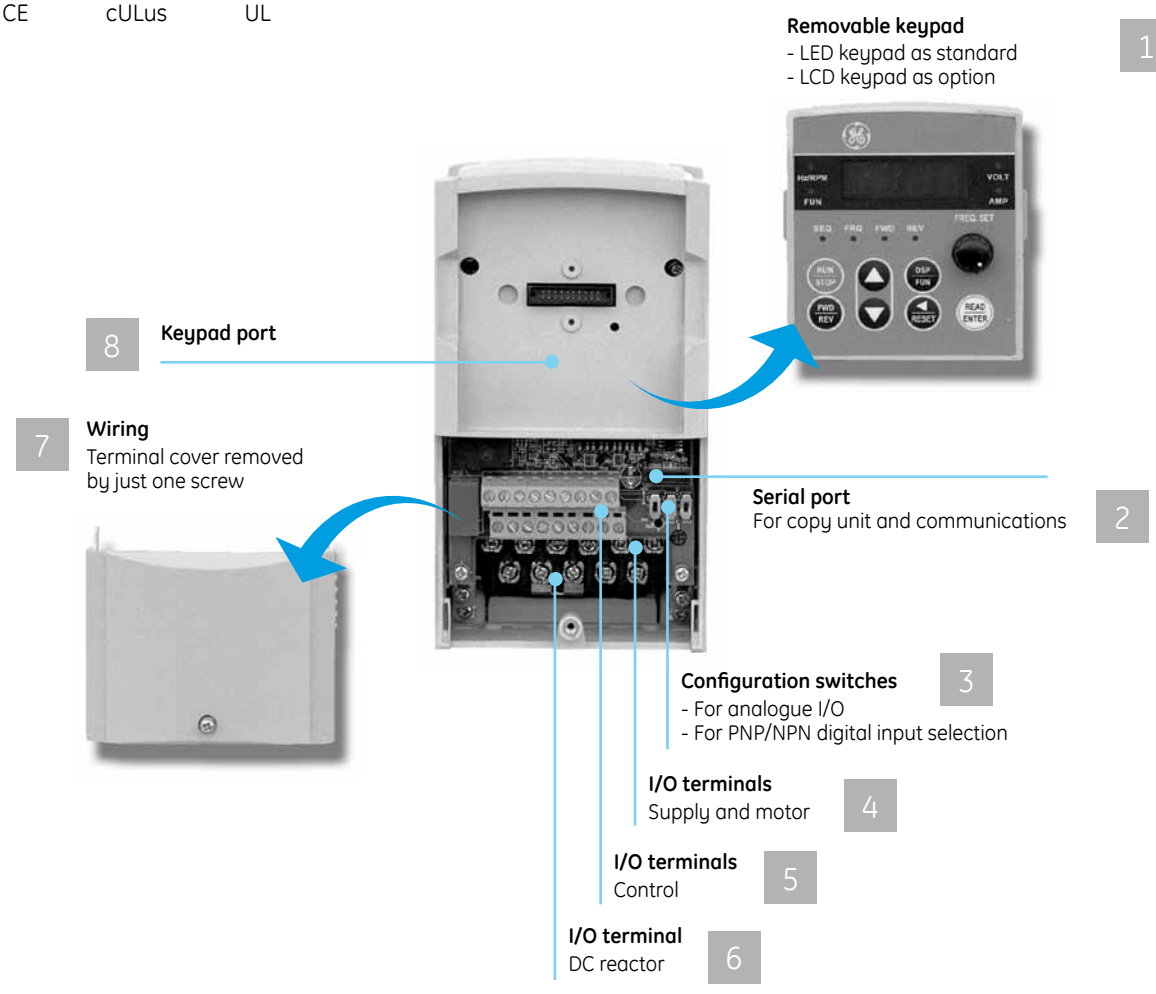
Advantages

- Compact size
- Built-in removable LED keypad
- Optional multilanguage LCD keypad
- Sensorless vector control or V/f control, selectable
- Built-in with ModBus RTU communications
- Optional Field bus communication DeviceNet, ProfibusDP
- Integrated EMC filters for U20...FS series
- Built-in with dynamic breaking up to 15kW
- Performed with simple PLC and PID functions
- Easy start-up & tunning by PC or keypad
- Advanced programming and drive control by built-in PLC function
- Easy maintenance

Approvals

CE cULus UL

Simple and reliable



1 phase and 3 phase speed drives

Input voltage + 10%, -15%, 50/60 Hz (± 5%)	Suitable motor capacity (kW)	Rated output current (A)	Rated capacity (KVA)	Frame	Cat. no.	Ref. no.	Pack.
Frame 1							
With EMC filter							
1ph 200V - 240V	0.4	3.1	1.2	1	**U201N00K4FS**	167400	1
	0.75	4.5	1.7	1	**U201N00K7FS**	167401	1
	1.5	7.5	2.9	2	**U201N01K5FS**	167402	1
	2.2	10.5	4.0	2	**U201N02K2FS**	167403	1
Without EMC filter							
1ph 200V - 240V	0.4	3.1	1.2	1	**U201N00K4SS**	167411	1
	0.75	4.5	1.7	1	**U201N00K7SS**	167412	1
	1.5	7.5	2.9	2	**U201N01K5SS**	167413	1
	2.2	10.5	4.0	2	**U201N02K2SS**	167414	1
Frame 2							
Without EMC filter							
3ph 200V - 240V	0.4	3.1	1.2	1	**U203N00K4SS**	167415	1
	0.75	4.5	1.7	1	**U203N00K7SS**	167416	1
	1.5	7.5	2.9	1	**U203N01K5SS**	167417	1
	2.2	10.5	4	2	**U203N02K2SS**	167418	1
	3.7	17.5	6.7	2	**U203N04K0SS**	167419	1
	5.5	26	9.9	3	**U203N05K5SS**	167420	1
	7.5	35	13.3	3	**U203N07K5SS**	167422	1
Frame 3							
With EMC filter							
3ph 380V - 480V	0.75	2.3	1.7	1	**U203X00K7FS**	167404	1
	1.5	3.8	2.9	1	**U203X01K5FS**	167405	1
	2.2	5.2	4	2	**U203X02K2FS**	167406	1
	3.7	8.8	6.7	2	**U203X04K0FS**	167407	1
	5.5	13	9.9	3	**U203X05K5FS**	167408	1
	7.5	17.5	13.3	3	**U203X07K5FS**	167409	1
	11	25	19.1	3	**U203X11K0FS**	167410	1
Without EMC filter							
3ph 380V - 480V	0.75	2.3	1.7	1	**U203X00K7SS**	167424	1
	1.5	3.8	2.9	1	**U203X01K5SS**	167425	1
	2.2	5.2	4	2	**U203X02K2SS**	167426	1
	3.7	8.8	6.7	2	**U203X04K0SS**	167427	1
	5.5	13	9.9	3	**U203X05K5SS**	167428	1
	7.5	17.5	13.3	3	**U203X07K5SS**	167429	1
	11	25	19.1	3	**U203X11K0SS**	167430	1
	15	32	27.4	4	**U203X15K0SS**	167481	1
	18.5	40	34	4	**U203X18K5SS**	167482	1
	22	48	41	4	**U203X22K0SS**	167483	1
	30	64	54	5	**U203X30K0SS**	167484	1
	37	80	68	5	**U203X37K0SS**	167485	1
	45	96	82	6	**U203X45K0SS**	167486	1
	55	128	110	6	**U203X55K0SS**	167487	1
Frame 4							

Accessories

	Description	Details	Cat. no.	Ref. no.	Pack.
U200ARS485 / 167435	External dynamic braking unit		**U200ABU430**	167468	1
	Communication interface	Profibus-DP	**U200APB**	167433	1
		DeviceNet	**U200ADN**	167434	1
		RS485	**U200ARS485**	167435	1
		RS232 for PC to drive	**U200ARS232**	167436	1
U200ARS232 / 167436	NEMA1 boxes	For frame 1 drives	**U200AN101**	167446	1
		For frame 2 drives	**U200AN102**	167447	1
		For frame 3 drives	**U200AN103**	167448	1
	Memory pack	Program copy	**U200AMP**	167437	1
	Keypad	LED (1)	**U200ALEDK**	167438	1
		LCD multilanguage	**U200ALCDK**	167439	1
		Blank cover	**U200ABK**	167440	1
U200AMP / 167437	Remote wire for keypad	0.5m	**U200AW05**	167441	1
		1.0m	**U200AW10**	167442	1
		2.0m	**U200AW20**	167443	1
		3.0m	**U200AW30**	167444	1
		5.0m	**U200AW50**	167445	1

(1) All VAT200 include a LED keypad U200ALEDK as standard.

Technical data

General specifications

		1ph 200-240V (with / without EMC filter)				3ph 200-240V (without EMC filter)						
		U201N_____S				U203N____SS						
		00K4	00K7	01K5	02K2	00K4	00K7	01K5	02K2	04K0	05K5	07K5
Motor ratings	(HP)	0.5	1	2	3	0.5	1	2	3	5.5	7.5	10
	(kW)	0.4	0.75	1.5	2.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5
Rated output current	(A)	3.1	4.5	7.5	10.5	3.1	4.5	7.5	10.5	17.5	26	35
Rated capacity	(kVA)	1.2	1.7	2.9	4	1.2	1.7	2.9	4	6.7	9.9	13.3
Max. input voltage		Single phase: 200-240V +10 -15%, 50/60Hz ±5%				Three phase: 380-480V, +10 -15%, 50/60Hz ±5%						
Max. output voltage		Three phase: 0 - 240V				Three phase: 0 - 240V						
Input current	(A)	8.5	12	19	27	4.5	6.5	11	15.4	20	29	40

		3ph 380-480V (with / without EMC filter)							3ph 380-480V (without EMC filter)						
		U203X_____S							U203X_____SS						
		00K7	01K5	02K2	04K0	05K5	07K5	11K0	15K0	18K5	22K0	30K0	37K0	45K0	55K0
Motor ratings	(HP)	1	2	3	5.5	7.5	10	15	20	25	30	40	50	60	75
	(kW)	0.75	1.5	2.2	3.7	5.5	7.5	11	15	18.5	22	30	37	45	55
Rated output current	(A)	2.3	3.8	5.2	8.8	13	17.5	25	32	40	48	64	80	96	128
Rated capacity	(kVA)	1.7	2.9	4	6.7	9.9	13.3	19.1	27.4	34	41	54	68	82	110
Max. input voltage		Three phase: 380-480V, +10 -15%, 50/60Hz ±5%							Three phase: 380-480V, +10 -15%, 50/60Hz ±5%						
Max. output voltage		Three phase: 0 - 480V							Three phase: 0 - 480V						
Input current	(A)	4.2	5.6	7.3	11.6	17	23	31	38	48	56	75	92	112	142

Frequency control

Control mode	V/f or sensorless vector control
Range	0.1 to 650.0 Hz
Starting torque	150% / 1 Hz (sensorless vector)
Speed control range	1 : 50 (sensorless vector)
Speed control accuracy	±0.5% (sensorless vector)
Setting resolution	Digital : 0.01 Hz Analogue: 0.06 Hz / 60 Hz (10 bits)
Keypad setting	Set directly by 56 keys or by potentiometer on the keypad
Display function	Four digital LED (or 2x16 LCD) and status indicator; display frequency / speed / line speed / DC voltage / output voltage / current / rotation direction / inverter parameter / trouble log / program version
Frequency setting	1. External potentiometer 0-5V / 0-10V / 4-20mA / 5-0V / 10-0V / 20-4mA 2. Performs up/down controls, speed control or automatic procedure control with multifunctional contacts on the terminal block (TM2)
Frequency limit function	Respectively setting upper/lower frequency limits and three-stage skip frequencies

Control

Carrier frequency	2 to 16kHz
V / F pattern	18 fixable patterns, 1 programmable pattern
Acc./Dec. control	Two-stage Acc./Dec. time (0.1 to 3.600 seconds) and two-stage S curve
Multifunctional analog output	5 different functions
Multifunctional input	Assigned to 28 different functions
Multifunctional output	Assigned to 15 different functions
Digital input signal	NPN / PNP toggle
Other functions	Momentary power loss restart, Speed search, Overload detection, Torque detection, 8 preset speeds, Acc./Dec. switch (2 stages), S curve, 3-wire control, PID control, Torque boost, Slip compensation, Frequency upper/lower limit, Auto energy saving, Modbus slave and control link, Abnormal restart, Sequence control, Built-in simple PLC function

Technical data *(continued)*

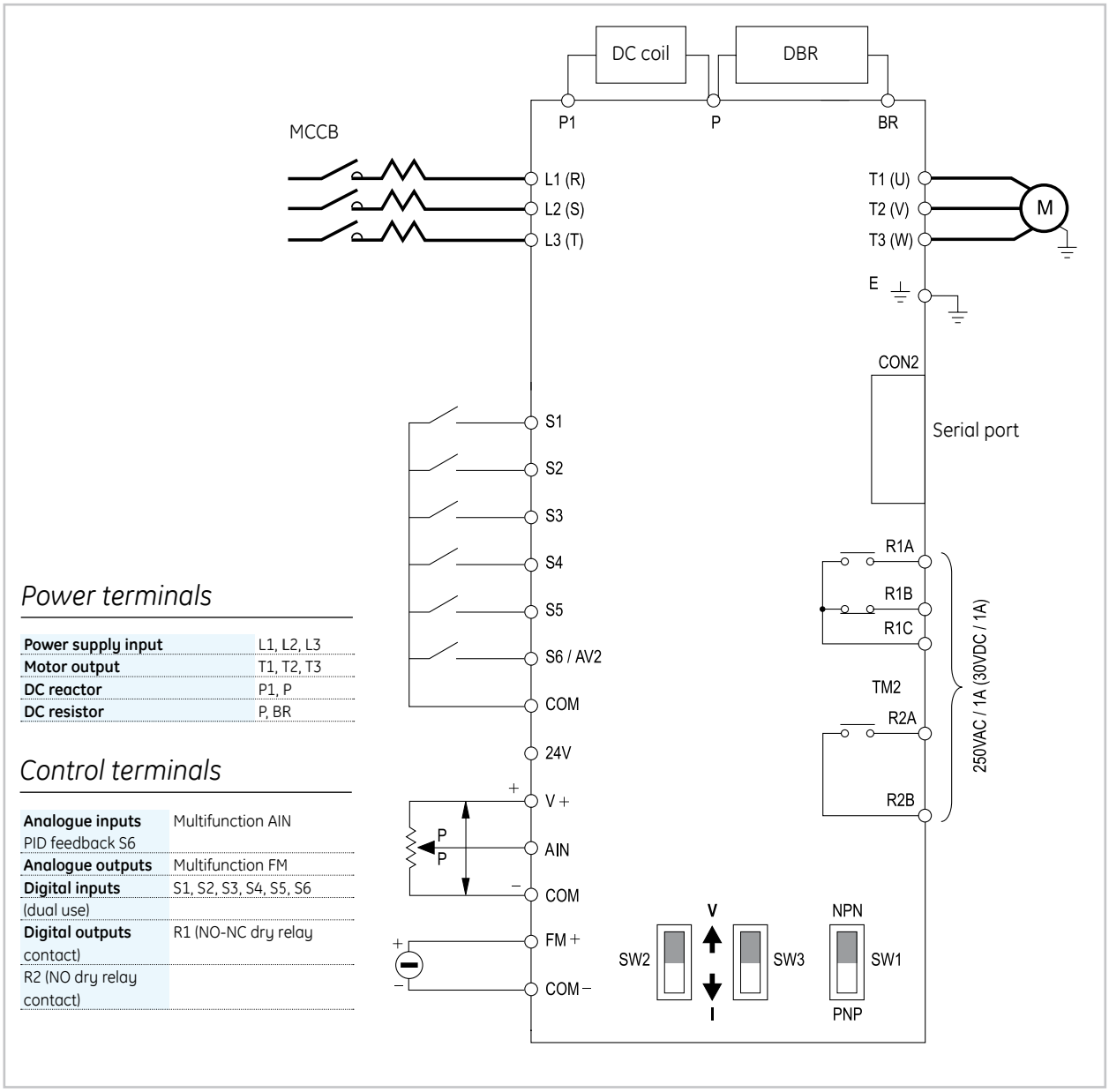
Others

Communication control	Control by RS232 or RS485
	One to one or multilink up to 254 stations (RS485 only)
	Can be set Baud rate, Stop bit and Parity bit
Braking torque	About 100% with braking resistor (20% without braking resistor)
Operation temperature	-10 to +50ºC
Storage temperature	-20 to +60ºC
Humidity	0 to 95% relative humidity (without condensation)
Vibration	1G (9.8m/S^2)
EMC	Comply with requirement EN 61800-3 with optional filter
LVD	Comply with requirement EN 50178
Enclosure	IP20 (NEMA 1 by external box attached)
Safety level	UL 508C

Protective functions

Overload protection	Inverse characteristic overload protection. Max. 150% inverter current rating / 60 sec.	
Fuse protection	The motor stops after FUSE melt	
Overvoltage	**200V class:** DC voltage > 410V	**400V class:** DC voltage > 820V
Undervoltage	**200V class:** DC voltage < 190V	**400V class:** DC voltage < 380V
Momentary power loss restart	Restart after more than 15ms-power loss possible. Programmed up to 2 sec.	
Stall prevention	Stall prevention for Acceleration / Deceleration / Operation	
Short-circuit output terminal	Electronic circuit protection	
Grounding fault	Electronic circuit protection	
Other protections	Heatsink overtemperature, overtorque detection, error contact control, reverse run restriction, restrictions for direct start after power up, error recovery and parameter lock out	

I/O Power & control layout



Power terminals

Power supply input	L1, L2, L3
Motor output	T1, T2, T3
DC reactor	P1, P
DC resistor	P, BR

Control terminals

Analogue inputs PID feedback S6	Multifunction AIN
Analogue outputs	Multifunction FM
Digital inputs (dual use)	S1, S2, S3, S4, S5, S6
Digital outputs contact)	R1 (NO-NC dry relay
R2 (NO dry relay contact)	

I/O Control terminal description

Symbol	Description		
R2A	Multifunctional terminals - Normally Open		
R2B			
R1C	Common contact	Multifunctional terminals Normally Open	Contact rated capacity 250VAC/1A or 30VDC/1A
R1B	Normally Closed contact		
R1A	Normally Open contact		
10V	Frequency knob (VR) power source terminal		
AIN	Analogue frequency signal input terminal		
24V	Common source for S1 to S5 in PNP input.		
	Selectable by switch on main PCB		
COM	Common terminal for S1 to S5 in NPN input.		
	Selectable by switch on main PCB		
FM +	Multifunction analog output, 0-10V DC		
S1	Multifunction input terminals		
S2			
S3			
S4			
S5			
S6 / AV2	Digital input or PID input terminal (selectable)		

External accessories

	VAT200		Losses W	AC reactors		DC reactors		Encapsulated resistor		Tubular resistors	
1ph 200-240V	**U201N00K4FS**	167400	32	**ACRP8A2H5**	168491	**DCR4A5H7**	168387	**ERN00K7**	129148	**TLR200P200**	129165
With	**U201N00K7FS**	167401	50	**ACRP12A2H5**	168492	**DCR6A3H9**	168388	**ERN00K7**	129148	**TLR200P200**	129165
EMC filter	**U201N01K5FS**	167402	85	**ACRP18A1H3**	168493	**DCR9A2H4**	168389	**ERN01K5**	129149	**TLR100P200**	108223
	U201N02K2FS	167403	157	**ACRP22A0H84**	168494	**DCR12A1H7**	168390	**ERN02K2**	129150	**TLR75P200**	116300
	U201N00K4SS	167411	28	**ACRP8A2H5**	168491	**DCR4A5H7**	168387	**ERN00K7**	129148	**TLR200P200**	129165
Without	**U201N00K7SS**	167412	45	**ACRP12A2H5**	168492	**DCR6A3H9**	168388	**ERN00K7**	129148	**TLR200P200**	129165
EMC filter	**U201N01K5SS**	167413	77	**ACRP18A1H3**	168493	**DCR9A2H4**	168389	**ERN01K5**	129149	**TLR100P200**	108223
	U201N02K2SS	167414	142	**ACRP22A0H84**	168494	**DCR12A1H7**	168390	**ERN02K2**	129150	**TLR75P200**	116300
3ph 200-240V	**U203N00K4SS**	167415	28	**ACRP4A2H5**	168495	**DCR4A5H7**	168387	**ERN00K7**	129148	**TLR200P200**	129165
Without	**U203N00K7SS**	167416	44	**ACRP6A2H5**	168496	**DCR6A3H9**	168388	**ERN00K7**	129148	**TLR200P200**	129165
EMC filter	**U203N01K5SS**	167417	74	**ACRP9A1H3**	168497	**DCR9A2H4**	168389	**ERN01K5**	129149	**TLR100P200**	108223
	U203N02K2SS	167418	140	**ACRP12A0H84**	168498	**DCR12A1H7**	168390	**ERN02K2**	129150	**TLR75P200**	116300
	U203N04K0SS	167419	247	**ACRP18A0H56**	168499	**DCR18A1H0**	168391	**ERN04K0**	129151	**TLR44P600**	129166
	U203N05K5SS	167420	274	**ACRP27A0H37**	168500	**DCRP32A0H78**	168542	**ERN05K5**	129152	**TLR29P600**	129167
	U203N07K5SS	167422	372	**ACRP35A0H27**	168501	**DCRP45A0H55**	168543	**ERN07K5**	129153	**TLR22P600**	129168
3ph 380-480V	**U203X00K7FS**	167404	45	**ACRP3A8H1**	168509	**DCR3A15H2**	168392	**ERX00K7**	129154	**TLR750P200**	116301
With	**U203X01K5FS**	167405	69	**ACRP4A5H1**	168510	**DCR4A9H2**	168393	**ERX01K5**	129155	**TLR400P200**	116302
EMC filter	**U203X02K2FS**	167406	137	**ACRP6A3H4**	168511	**DCR6A6H8**	168394	**ERX02K2**	129156	**TLR240P200**	108227
	U203X04K0FS	167407	231	**ACRP10A2H**	168512	**DCR9A4H0**	168395	**ERX04K0**	129157	**TLR175P600**	129173
	U203X05K5FS	167408	361	**ACRP14A1H4**	168513	**DCRP18A2H9**	168555	**ERX05K5**	129158	**TLR118P600**	129174
	U203X07K5FS	167409	446	**ACRP18A1H1**	168514	**DCRP25A2H1**	168556	**ERX07K5**	129159	**TLR86P600**	129175
	U203X11K0FS	167410	656	**ACRP27A0H75**	168515	**DCRP32A1H6**	168557	-	-	**TLR43P1000**	129177
Without	**U203X00K7SS**	167424	40	**ACRP3A8H1**	168509	**DCR3A15H2**	168392	**ERX00K7**	129154	**TLR750P200**	116301
EMC filter	**U203X01K5SS**	167425	62	**ACRP4A5H1**	168510	**DCR4A9H2**	168393	**ERX01K5**	129155	**TLR400P200**	116302
	U203X02K2SS	167426	123	**ACRP6A3H4**	168511	**DCR6A6H8**	168394	**ERX02K2**	129156	**TLR240P200**	108227
	U203X04K0SS	167427	208	**ACRP10A2H**	168512	**DCR9A4H0**	168395	**ERX04K0**	129157	**TLR175P600**	129173
	U203X05K5SS	167428	325	**ACRP14A1H4**	168513	**DCRP18A2H9**	168555	**ERX05K5**	129158	**TLR118P600**	129174
	U203X07K5SS	167429	402	**ACRP18A1H1**	168514	**DCRP25A2H1**	168556	**ERX07K5**	129159	**TLR86P600**	129175
	U203X11K0SS	167430	591	**ACRP27A0H75**	168515	**DCRP32A1H6**	168557	-	-	**TLR43P1000**	129177
	U203X15K0SS	167481	1051	**ACRP35A0H58**	168516	-	-	-	-	**TLR43P1000**	129177
	U203X18K0SS[1]	167482	1218	**ACRP38A0H58**	168517	-	-	-	-	**TLR35P1500**	129877
	U203X22K0SS[1]	167483	1449	**ACRP45A0H45**	168518	-	-	-	-	**TLR29P1800**	129878
	U203X30K0SS[1]	167484	1608	**ACRP70A0H29**	168519	**included**	-	-	-	**TLR22P2500**	129879
	U203X37K0SS[2]	167485	1993	**ACRP90A0H22**	168520	**included**	-	-	-	**TLR35P1500**[3]	129877
	U203X45K0SS[2]	167486	2270	**ACRP115A0H18**	168521	**included**	-	-	-	**TLR29P1800**[3]	129878
	U203X55K0SS[2]	167487	2957	**ACRP160A0H14**	168522	**included**	-	-	-	**TLR22P2500**[3]	129879

(1) (2) Drives 18.5kW and above do not built dynamic breaking. In case this is needed, use external breaking unit U200ABU430.
(2) (3) Dynamic breaking for drives 45kW, 55kW may need the use of two sets of breaking units U200ABU430 in parallel with two sets of breaking resistors (one resistor per breaking unit).

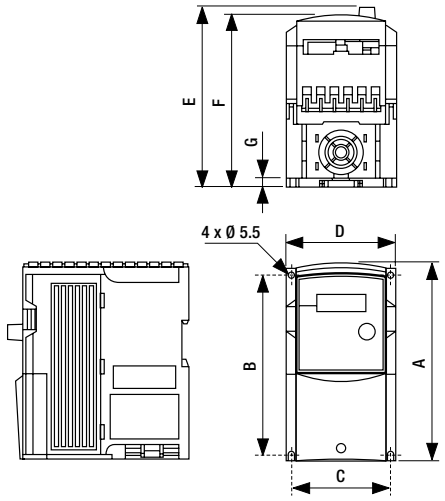
EMC compliance

Drives with built-in filter type U20....FS, comply with EN 618000-3 second environment.
To comply with first environment restricted sector, or to allow EMC compliance to U20....SS drives, an external filter has to be used according following table

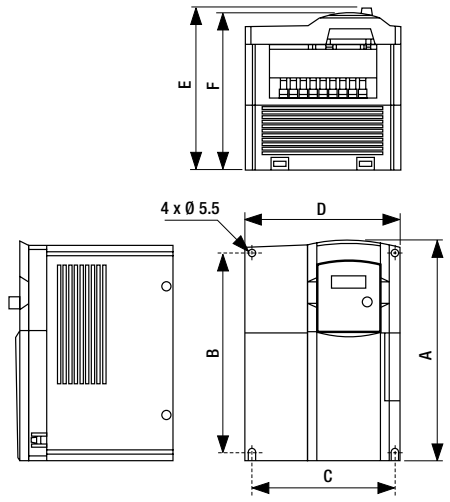
	VAT200		Second environment		First environment	
1ph 200-240V With EMC filter	**U201N00K4FS**	167400	Not needed		**U200F611TA1**	167453
	U201N00K7FS	167401	Not needed		**U200F611TA1**	167453
	U201N01K5FS	167402	Not needed		**U200F627TA2**	167454
	U201N02K2FS	167403	Not needed		**U200F627TA2**	167454
Without EMC filter	**U201N00K4SS**	167411	**U200F611TA1**	167453		
	U201N00K7SS	167412	**U200F611TA1**	167453		
	U201N01K5SS	167413	**U200F627TA2**	167454		
	U201N02K2SS	167414	**U200F627TA2**	167454		
3ph 200-240V Without EMC filter	**U203N00K4SS**	167415	**U200F709TA1**	167456		
	U203N00K7SS	167416	**U200F709TA1**	167456		
	U203N01K5SS	167417	**U200F709TA1**	167456		
	U203N02K2SS	167418	**U200F719TA2**	167457		
	U203N04K0SS	167419	**U200F719TA2**	167457		
	U203N05K5SS	167420	**U200F739TA3**	167458		
	U203N07K5SS	167422	**U200F739TA3**	167458		
3ph 380-480V With EMC filter	**U203X00K7FS**	167404	Not needed		**U200F905TA1**	167459
	U203X01K5FS	167405	Not needed		**U200F905TA1**	167459
	U203X02K2FS	167406	Not needed		**U200F910TA2**	167460
	U203X04K0FS	167407	Not needed		**U200F910TA2**	167460
	U203X05K5FS	167408	Not needed		**U200F928TA3**	167461
	U203X07K5FS	167409	Not needed		**U200F928TA3**	167461
	U203X11K0FS	167410	Not needed		**U200F928TA3**	167461
Without EMC filter	**U203X00K7SS**	167424	**U200F905TA1**	167459		
	U203X01K5SS	167425	**U200F905TA1**	167459		
	U203X02K2SS	167426	**U200F910TA2**	167460		
	U203X04K0SS	167427	**U200F910TA2**	167460		
	U203X05K5SS	167428	**U200F928TA3**	167461		
	U203X07K5SS	167429	**U200F928TA3**	167461		
	U203X11K0SS	167430	**U200F928TA3**	167461		
	U203X15K0SS	167481	**U200F34048SMA**	167474		
	U203X18K0SS	167482	**U200F370A**	167475		
	U203X22K0SS	167483	**U200F370A**	167475		
	U203X30K0SS	167484	**U200F3100A**	167476		
	U203X37K0SS	167485	**U200F3100A**	167476		
	U203X45K0SS	167486	**U200F3150A**	167477		
	U203X55K0SS	167487	**U200F3180A**	167478		

Dimensions

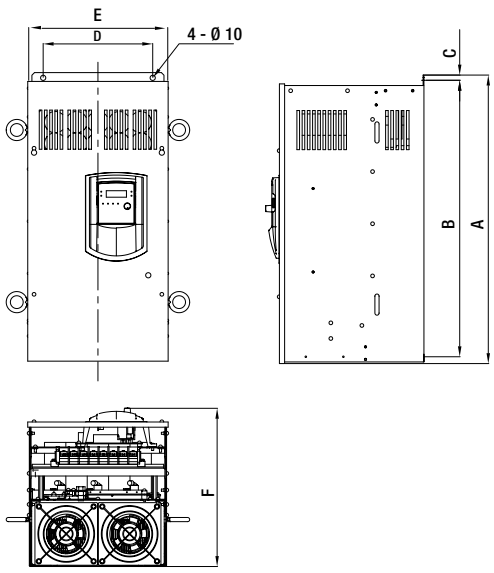
Speed drive



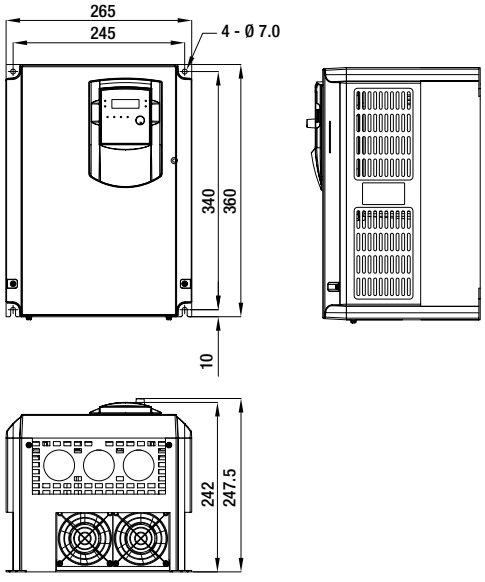
	Weight (kg)		Dimensions (mm)						
	Series								
	SS	FS	A	B	C	D	E	F	G
U201N00K4..	1.2	1.3	163	150	78	90	147	141	7
U201N00K7..	1.2	1.3							
U203N00K4..	1.2	-							
U203N00K7..	1.2	-							
U203N01K5..	1.2	-							
U203X00K7..	1.2	1.3							
U203X01K5..	1.2	1.3							
U201N01K5..	1.5	1.8	187	170.5	114.5	128	148	142	7
U201N02K2..	1.9	2.3							
U203N02K2..	1.75	-							
U203N04K0..	1.9	-							
U203X02K2..	1.8	2.2							
U203X04K0..	1.9	2.3							



	Weight (kg)		Dimensions (mm)					
	Series							
	SS	FS	A	B	C	D	E	F
U203N05K5..	5.6	-	260	244	173	186	195	188
U203N07K5..	5.6	-						
U203X05K5..	5.6	6.6						
U203X07K5..	5.6	6.6						
U203X11K0..	5.6	6.6						



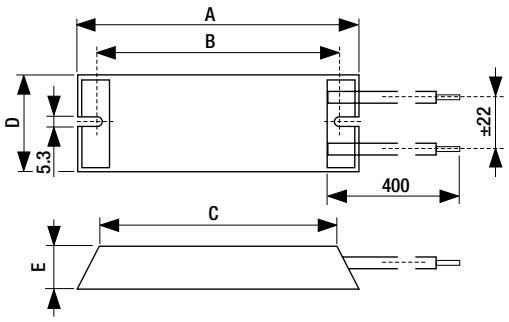
	Weight (kg)	Dimensions (mm)					
		A	B	C	D	E	F
U203X30K0SS	33	553	530	10	210	269	303
U203X37K0SS	33	553	530	10	210	269	303
U203X45K0SS	50	653	630	10	250	308	308
U203X55K0SS	50	653	630	10	250	308	308



	Weight (kg)
U203X15K0SS	15
U203X18K5SS	15
U203X22K0SS	15

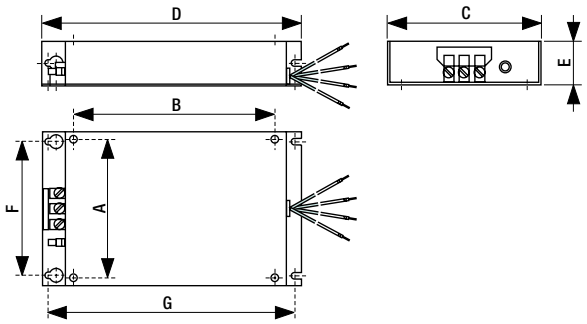
Dimensions *(continued)*

Braking resistor

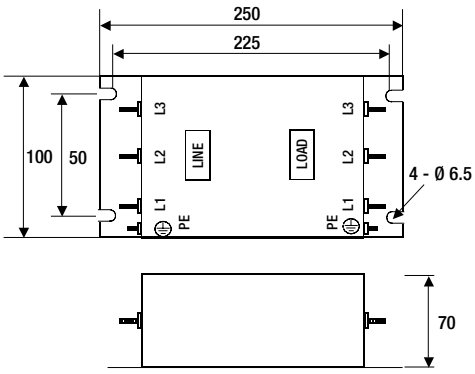


		A	B	C	D	E
ERN00K7	129148	115	80	175	40	20
ERX00K7	219154					
ERN01K5	129149	215	200	175	40	20
ERX01K5	129155					
ERN02K2	129150	165	150	125	60	30
ERX02K2	129156					
ERN04K0	129151	215	200	175	60	30
ERX04K0	129157					
ERN05K5	129152	335	320	295	60	30
ERN07K5	129153					
ERX05K5	129158					
ERX07K5	129159					

EMC external filter



		Inverter mounting		External filter size			External filter mount.	
		A	B	C	D	E	F	G
U200F611TA1	167453	78	150	91	192	28	74	181
U200F709TA1	167456							
U200F905TA1	167459							
U200F627TA2	167454	114.5	170.5	128	215	37	111	204
U200F719TA2	167457							
U200F910TA2	167460							
U200F739TA3	167458	173	244	188	289	42	165	278
U200F928TA3	167461							



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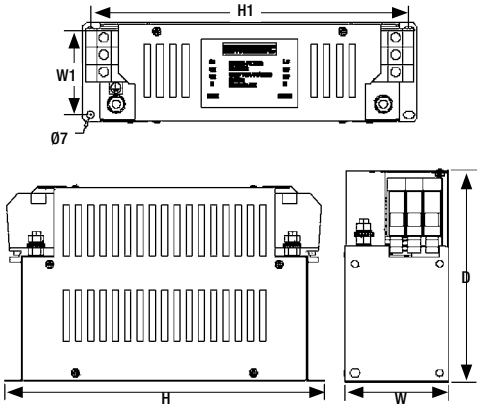
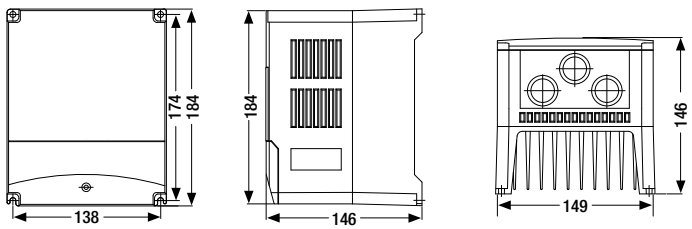


		Dimensions (mm)						
		W	W1	H	H1	D	d	M
U200F370A	167475	93	79	312	298	190	7	M6
U200F3100A	167476	93	79	312	298	190	7	M6
U200F3150A	167477	126	112	312	298	224	7	M6
U200F3180A	167478	126	112	312	298	224	7	M6

External dynamic braking unit



		Weight (kg)
U200ABU430	167468	2.3

Dimensions *(continued)*

AC Input reactors

Fig. 1

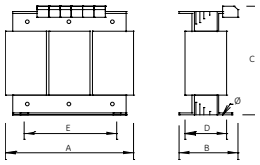


Fig. 3

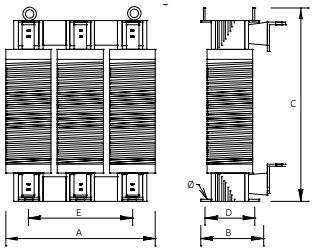
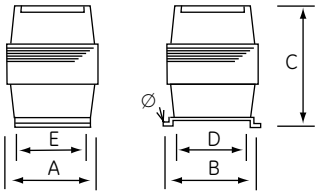


Fig. 4



Cat. No.	Ref.No.	Losses W	Fig.	Dimensions (mm)						Weight (kg)
				A	B	C	D	E	Ø	
ACRP8A2H5	168491	5.2	4	75	96	100	80	56	6	1.8
ACRP12A2H5	168492	6.8	4	84	102	110	86	65	6	2.7
ACRP18A1H3	168493	7.3	4	96	112	106	96	77	6	3.2
ACRP22A0H84	168494	8	4	96	112	116	96	77	6	3.7
ACRP4A2H5	168495	16	1	120	80	152	41	100	6	1.3
ACRP6A2H5	168496	18	1	120	80	152	41	100	6	1.5
ACRP9A1H3	168497	17	1	120	80	152	41	100	6	1.6
ACRP12A0H84	168498	18	1	120	80	152	41	100	6	1.7
ACRP18A0H56	168499	21	1	120	90	152	51	100	6	2.4
ACRP27A0H37	168500	32	1	150	95	183	46	125	6	3.3
ACRP35A0H27	168501	35	1	150	95	183	46	125	6	3.7
ACRP3A8H1	168509	17	1	120	80	152	41	100	6	1.4
ACRP4A5H1	168510	16	1	120	80	152	41	100	6	1.5
ACRP6A3H4	168511	19	1	120	80	152	41	100	6	1.7
ACRP10A2H	168512	23	1	120	90	152	51	100	6	2.5
ACRP14A1H4	168513	29	1	150	95	178	46	125	6	3.2
ACRP18A1H1	168514	35	1	150	95	178	46	125	6	4
ACRP27A0H75	168515	77	1	150	106	233	72	100	9	4.8
ACRP35A0H58	168516	98	1	150	111	233	77	100	9	5.5
ACRP38A0H58	168517	96	1	150	116	233	82	100	9	6.4
ACRP45A0H45	168518	102	1	150	121	233	87	100	9	7.1
ACRP70A0H29	168519	147	1	150	151	250	117	100	9	11
ACRP90A0H22	168520	158	1	180	136	286	102	120	9	13.1
ACRP115A0H18	168521	186	1	180	156	301	122	120	9	16.9
ACRP160A0H14	168522	268	3	240	181	288	107	160	9	25.7

DC reactors

Fig. 2

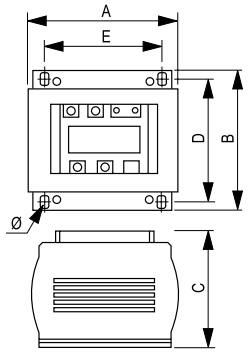
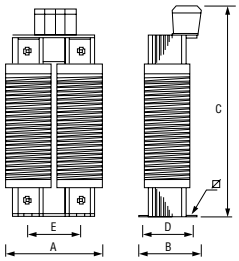


Fig. 5



Cat. No.	Ref.No.	Losses W	Fig.	Dimensions (mm)						Weight (kg)
				A	B	C	D	E	Ø	
DCR4A5H7	168387	4	2	50	97	84	80	34	6	0.78
DCR6A3H9	168388	6	2	50	97	94	80	34	6	0.94
DCR9A2H4	168389	9	2	75	96	95	80	56	6	1.3
DCR12A1H7	168390	15	2	75	96	95	80	56	6	1.3
DCR18A1H0	168391	22	2	75	96	110	80	56	6	1.8
DCR3A15H2	168392	4	2	50	97	94	80	34	6	0.94
DCR4A9H2	168393	4	2	75	96	95	80	56	6	1.3
DCR6A6H8	168394	6	2	75	96	95	80	56	6	1.3
DCR9A4H0	168395	9	2	75	96	95	80	56	6	1.3
DCRP32A0H78	168542	37	5	100	110	173	91	75	6	3.9
DCRP45A0H55	168543	33	5	120	110	203	86	90	6	6.1
DCRP18A2H9	168555	42	5	100	95	178	76	75	6	3.5
DCRP25A2H1	168556	54	5	100	95	183	76	75	6	3.5
DCRP32A1H6	168557	59	5	100	110	183	91	75	6	3.9

Advanced general purpose AC drive

VAT300 is a new generation of high performance VSD, including latest technology in both software and hardware.

Approvals

CE Compliance, UL, cUL

Features

- The new drive, with smaller foot print than the former generation, covers the power ratings from 0.75kW to 475kW in normal duty, or up to 400kW in heavy duty.
- High starting torque up to 200% or more, can be achieved even using standard induction motors.
- VAT300 is able to drive, not only the standard induction motors, but also the new generation of permanent magnet motors. In both cases, sensorless or close loop control are available.
- As well as satisfying industry requirements, with its advanced and high performance functions, VAT300 is hailed a truly environmentally friendly drive with dedicated energy saving functions and careful selection of components to meet environmental directives.

Advantages

- **Multimode control - *All in one single drive***
  - V/f control for constant torque loads and quadratic loads
  - Vector control, both closed loop and sensorless
  - PM motor control, both closed loop and sensorless
- **Dynamic breaking built-in the drive up to 22kW**
- **Advanced features**
  - User programmable built-in PLC
  - Configurable PID control
  - Multi-pump control
- **Communications**
  - ModBus, ProfibusDP, DeviceNet, CANopen, CC-Link
- **Dedicated version drive for lift application – *VAT300L***
- **Environmentally friendly design**
  - RoHS Directive compliant
  - High efficiency operation
  - Dioxin-free plastic cases
- **Global design**
  - Meet global standards UL, cUL, CE
  - Multi-language interface

High performance AC drive

Input Voltage [1]	Normal Duty Overload 120%, 60s [2]			Heavy Duty Overload 150%, 60s [3]					
	Maximum motor power (kW)	Output current (A)	Input power (kVA)	Maximum motor power (kW)	Output current (A)	Input power (kVA)	Protection degree	Cat. no. [4]	Ref. no.
With built-in EMC filters									
3ph 380-480V 50/60Hz, +/-5%	0.75	2,5	1.7	0.4	1.5	1.0	IP20	**U3SX000K7FBS**	129318
	1.5	3,6	2.5	0.75	2.5	1.7	IP20	**U3SX001K5FBS**	129319
	2.2	5,5	3.8	1.5	3.6	2.5	IP20	**U3SX002K2FBS**	129320
	3.7	8,6	6.0	2.2	5.5	3.8	IP20	**U3SX004K0FBS**	129321
	5.5	13	9.0	3.7	8.6	6.0	IP20	**U3SX005K5FBS**	129322
	7.5	17	12	5.5	13	9.0	IP20	**U3SX007K5FBS**	129323
	11	23	16	7.5	17	12	IP20	**U3SX011K0FBS**	129324
	15	31	21	11	23	16	IP20	**U3SX015K0FBS**	129325
	18.5	37	26	15	31	21	IP20	**U3SX018K5FBS**	129326
	22	44	30	18.5	37	26	IP20	**U3SX022K0FBS**	129327
	30	60	42	22	44	30	IP20	**U3SX030K0FNS**	129328
Without built-in EMC filters									
3ph 380-480V 50/60Hz, +/-5%	0.75	2,5	1.7	0.4	1.5	1.0	IP20	**U3SX000K7SBS**	129329
	1.5	3,6	2.5	0.75	2.5	1.7	IP20	**U3SX001K5SBS**	129330
	2.2	5,5	3.8	1.5	3.6	2.5	IP20	**U3SX002K2SBS**	129331
	3.7	8,6	6.0	2.2	5.5	3.8	IP20	**U3SX004K0SBS**	129332
	5.5	13	9.0	3.7	8.6	6.0	IP20	**U3SX005K5SBS**	129333
	7.5	17	12	5.5	13	9.0	IP20	**U3SX007K5SBS**	129334
	11	23	16	7.5	17	12	IP20	**U3SX011K0SBS**	129335
	15	31	21	11	23	16	IP20	**U3SX015K0SBS**	129336
	18.5	37	26	15	31	21	IP20	**U3SX018K5SBS**	129337
	22	44	30	18.5	37	26	IP20	**U3SX022K0SBS**	129338
	30	60	42	22	44	30	IP20	**U3SX030K0SNS**	129339
	37	73	51	30	60	42	IP00	**U3SX037K0SNS**	129340
	45	87	60	37	73	51	IP00	**U3SX045K0SNS**	129341
	55	108	75	45	87	60	IP00	**U3SX055K0SNS**	129342
	75	147	102	55	108	75	IP00	**U3SX075K0SNS**	129343
	90	179	124	75	147	102	IP00	**U3SX090K0SNS**	129344
	110	214	148	90	179	124	IP00	**U3SX110K0SNS**	129345
	132	249	173	110	214	148	IP00	**U3SX132K0SNS**	129346
	160	321	222	132	249	173	IP00	**U3SX160K0SNS**	129347
	200	428	297	160	321	222	IP00	**U3SX200K0SNS**	129348
	250	519	360	200	428	297	IP00	**U3SX250K0SNS**	129349
	315	590	409	250	519	360	IP00	**U3SX315K0SNS**	129350
	400	740	513	315	590	409	IP00	**U3SX400K0SNS**	129351
	475	870	603	400	740	513	IP00	**U3SX475K0SNS**	129352
With built-in EMC filters									
3ph 200-240V 50/60Hz, +/-5%	0.75	5	1.7	0.4	3	1.0	IP20	**U3SN000K7FBS**	129300
	1.5	8	2.8	0.75	5	1.7	IP20	**U3SN001K5FBS**	129301
	2.2	11	3.8	1.5	8	2.8	IP20	**U3SN002K2FBS**	129302
	3.7	16	5.5	2.2	11	3.8	IP20	**U3SN004K0FBS**	129303
	5.5	24	8.3	3.7	16	5.5	IP20	**U3SN005K5FBS**	129304
Without built-in EMC filters									
3ph 200-240V 50/60Hz, +/-5%	0.75	5	1.7	0.4	3	1.0	IP20	**U3SN000K7SBS**	129305
	1.5	8	2.8	0.75	5	1.7	IP20	**U3SN001K5SBS**	129306
	2.2	11	3.8	1.5	8	2.8	IP20	**U3SN002K2SBS**	129307
	3.7	16	5.5	2.2	11	3.8	IP20	**U3SN004K0SBS**	129308
	5.5	24	8.3	3.7	16	5.5	IP20	**U3SN005K5SBS**	129309
	7.5	33	11	5.5	24	8.3	IP20	**U3SN007K5SBS**	129310
	11	46	16	7.5	33	11	IP20	**U3SN011K0SBS**	129311
	15	61	21	11	46	16	IP20	**U3SN015K0SBS**	129312
	18.5	76	26	15	61	21	IP20	**U3SN018K5SBS**	129313
	22	88	30	18.5	76	26	IP00	**U3SN022K0SNS**	129314
	30	118	41	22	88	30	IP00	**U3SN030K0SNS**	129315
	37	146	51	30	118	41	IP00	**U3SN037K0SNS**	129316
	45	174	60	37	146	51	IP00	**U3SN045K0SNS**	129317

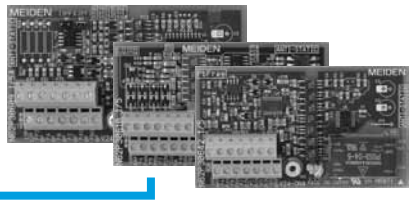
(1) Voltage tolerance
380-480V series: +/-10% up to drive U3SX055K0. For U3SX075K0 and above +5%.
200-240V series: +/-10% all range.

(2) Normal duty: 120% for 1 min., 140% for 2.5 seconds
- Ambient temperature -10 to 50ºC. Above 40ºC note following deratings:
  For drive U3SN005K0, reduce output current by 2% per 1ºC.
  For drives U3SN011K0, U3SX005K5 and U3SX015K0, reduce output current by 1% per 1ºC.
- For carrier frequency above 4kHz, note following deratings:
  For 200-240V series, reduce output current by 3% per kHz.
  For 380-480V series, reduce output current by 5% per kHz.
  Check user manual of VAT300 for additional details.

(3) Heavy duty: 150% for 1 min., 175% for 2.5 seconds
- Ambient temperature -10 to 50ºC, for all ratings.
- For carrier frequency above 4kHz, note following deratings.
  For 200-240V series, reduce output current by 3% per kHz.
  For 380-480V series, reduce output current by 3-5% per kHz, depending the unit rating.
  Check user manual of VAT300 for additional details.

(4) Dynamic braking circuit
This is included as standard for all drives up to 22kW (400V series), and up to 18.5kW (200V series). Catalogue numbers, up to U3SX022K0 or up to U3SN018K5.

Optional interfaces and accessories



Item	Description	Cat. No.	Ref. no.
I/O interfaces			
Encoder interface DN1	For 12VDC, A/B phase, complimentary type encoder	**U30V24DN1**	129388
Encoder interface DN2	For 5VDC, A/B/Z/S phase, line driver type encoder	**U30V24DN2**	129389
Encoder interface DN3	For 5VDC, A/B/Z/U/V/W phase encoder, for the PM drive control (pole position). This encoder interface is compatible with the line driver output type encoder	**U30V24DN3**	129390
Encoder interface DN5	Speed detection interface, compatible with Heidenhain ERN 1387. 1Vpp 2-phase, 2-set sine wave + Z-phase pulse encoders	**U30V24DN5**	129391
Encoder interface DN6	5VDC, A/B phase, complimentary type encoder	**U30V24DN6**	129393
Digital I/O interface	Additional 4 I + 4O (relay) interface	**U30V24RY0**	129394
Analog I/O interface	Insulated 4 channel analogue I/O	**U30V24AIO**	129396
Communication interfaces			
ProfibusDP interface	Standard field bus communications interface ProfibusDP	**U30V24SL0**	129397
CAN-Open interface	Standard field bus communications interface CAN-Open	**U30V24SL1**	129398
DeviceNet interface	Standard field bus communications interface DeviceNet	**U30V24SL2**	129399
CC-Link interface	Standard field bus communications interface DeviceNet	**U30V24SL3**	129400
Other accessories			
Extension keypad´s cable	For keypad remote mounting (length = 3 meter)	**U2KV23W103**	168102
LCD keypad	Operator interface LCD	**U30V24OP1**	129353
LED keypad	Operator interface LED	**U30V24OP2**	129354

Technical data

Ratings

Voltage ratings 200V series (U3SN__) 400V series (U3SX__)	Supply Voltage: 3ph, 200-240VAC, ±10%. Supply frequency: 50/60Hz, ±5% Supply Voltage: 3ph, 380-480VAC, ±10%(*) (*) For drives above U3SX055K0 (>55kW), Voltage tolerance is –10%, +5%, over 480VAC

Frequency control

Control method	All digital control, sine wave approximation PWM
Carrier frequency	
Mono-Sound Mode	1 to 15kHz (0.1kHz increments)
Soft Sound Mode	Average frequency 2.1 to 5kHz with 3 or 4 tone modulation
Output frequency resolution	0.01Hz
Frequency setting resolution	
Digital	0.01Hz
Analogue	0.03% , In respect to maximum frequency
Frequency accuracy	
Digital	±0.01% at 25±10°C
Analogue	±0.0% at 25±10°C
Output frequency	0-440Hz in V/f control 0-180Hz in vector control for induction motors 0-210Hz in PM mode control, for PM motors

Control specifications

V/f control	Standard control for induction motors with advanced characteristics: - Constant torque, constant output and quadratic characteristics randomly set in the range of 3-440 Hz - High performance torque boost. (Automatic Torque Control)
Speed control for IM [1]	High performance vector control for Induction motors
	Sensorless / Close Loop
Control range	1:100 / 1:1000
Constant output range	Up to 1:2 / Up to 1:4
Speed accuracy (Fmax≥50Hz)	±0.5% / ±0.01%
Control response	5Hz / 30Hz
Speed control for PM [1]	High performance control for permanent magnet motors
	Sensorless / Close Loop
Control range	1:5 / 1:100
Constant output range	Up to 1:1.5 / Up to 1:1.5
Speed accuracy (Fmax≥50Hz)	±0.01% / ±0.01%
Automatic tuning	Automatic measurements of motor constants and critical parameters, for all mode control Available for all control modes, V/f, vector control and PM motor control
Starting torque [1]	200% of more, using standard motor, 150% rated current
Acceleration / deceleration time	0.01 to 60000sec, 11 independent settings Two for standard accel/decel. time, other for jogging, and eight more for program cushion Linear and S-Ramp available
Operating mode (three selective modes)	- Forward run or reverse run, permanent command by two digital inputs - RUN / STOP and forward / reverse changeover, permanent command by two digital inputs - RUN / STOP pulse command by push buttons
Stop method	Selectable either ramp down to stop or coast to stop - Independent selectable for run/stop, jog, and emergency stop
Dynamic braking	Included as standard for all drives up to 22kW (400V series), and up to 18.5kW (200V series)
DC braking	- Breaking stop frequency, set from 0.1 to 60.0Hz - Breaking voltage, set between 0.1 and 20% - Breaking time, set between 0.0 and 20s

I/O control

Operator keypad	- Local (keypad) and remote operation changeover - Forward, reverse, stop by key-switches - Change, copy, save facilities of all parameters - Removable and mountable outside the unit by extension wirings
LCD keypad	Two rows, 16 characters each. Multi-language format Quick parameter search by rotary knob
LED keypad	7 segment LED, five digit display and seven points LED indications Parameter search by up / down keys
Analogue I/O	Three analogue inputs for speed or torque control, and two analogue output as standard. All programmable
Analogue inputs	AI1 and AI2: Either voltage 0-10V, 0-5V, 1-5V or current 0-20mA, 4-20mA AI3: Voltage input 0 to ±10V, 0 to ±5V P10: Voltage source for potentiometer speed setting
Analogue outputs	AO1 and AO2: Both configurable either as voltage 0-10V or current 4-20mA, for metering purpose Programmable with more than 20 available functions
Digital I/O	Seven digital inputs, and five digital outputs as standard. All programmable.
Digital inputs	Seven, PSI1-PSI7. Configurable source or sink logic. Programmable with more than 50 functions. Input PSI7, can be used as pulse setting (max 10kHz).
Digital outputs	Two dry relay and three open collector transistors. Programmable with more than 50 functions
Communication I/O	Standard RS485 port. I/O carried out by standard RJ connector or screw terminals. ModBus RTU, standard protocol is built-in the drive as standard

Functions

Standard functions

Multi-pump control	Control of up to 8 pumps, one controlled in speed and the others ON/OFF. Allows rotation of the outputs to ensure same running time for all the pumps, including the speed controlled pump. Sleep / wake-up function included
PID regulator	Allows close-loop control for process like pressure control, flow etc, including limit detection. When this function is enabled, VAT300 automatically controls the motor speed to keep the process required set point
Energy saving function	This function automatically decreases output voltage according to the load, improving motor efficiency
Built-in PLC	Logic and arithmetic operations. I/O management Program capacity: 16 instructions per bank (max 20 banks). Scan: 2ms per bank
Automatic run	10 step automatic run function
Traverse run	Specific function for textile industry, weaving machines
Speed time pattern	Specific function for spinning frame machines
Auxiliary drives	Switchover of up to four sets of motorparameters
External brake control	ON / OFF control of external mechanical brake with feedback and other advanced features
UP/DOWN	Function that allow motor speed UP/DOWN by push buttons. This function can be combined with other reference signals, analogue or digital
Multi-step speed setting	8 fixed speed, selectable, with independent acceleration / deceleration time setting
Acceleration / deceleration multiple ramp times	Up to 11 independent time settings. One for Jogging, two for default acceleration / deceleration and eight more for the multi-speed function
Multi-step speed setting	8 fixed speed, selectable, with independent acceleration / deceleration time setting
Ratio interlock speed	Speed reference Input / Output ratio is can be controlled according y = Ax + B + C y: Output frequency or Speed x: Frequency or speed reference A: Gain, adjustable from 0.000 to ±10.000 B: Adjustable from 0.00 to ±440.00Hz C: Bias signal from auxiliary input
Ratio interlock torque	Torque reference Input / Output ratio is can be controlled according above given expression
Pick-Up (Flying start)	This function is useful to restart a free-wheel rotating motor even if it is rotating in reverse direction
Retry	Automatic re-start after a failure. Provides up to 10 programmable re-trials with programmable time between trials
Frequency skip	Three skip areas. Width can be varied from 0.0Hz up to 10Hz. Operates in V/f control only
Droop	Useful function that help load balance when several motors are mechanically coupled
Automatic tuning	Automatic measurements of motor constants and other critical parameters, for all mode of control like V/f, Vector control and PM motor control
Torque control	By this function, is possible to control the motor torque by means of analogue or digital signals
Adaptable and programmable I/O	Programmable inputs and outputs can be asigned up to 50 functions each. Can be adapted to application needs

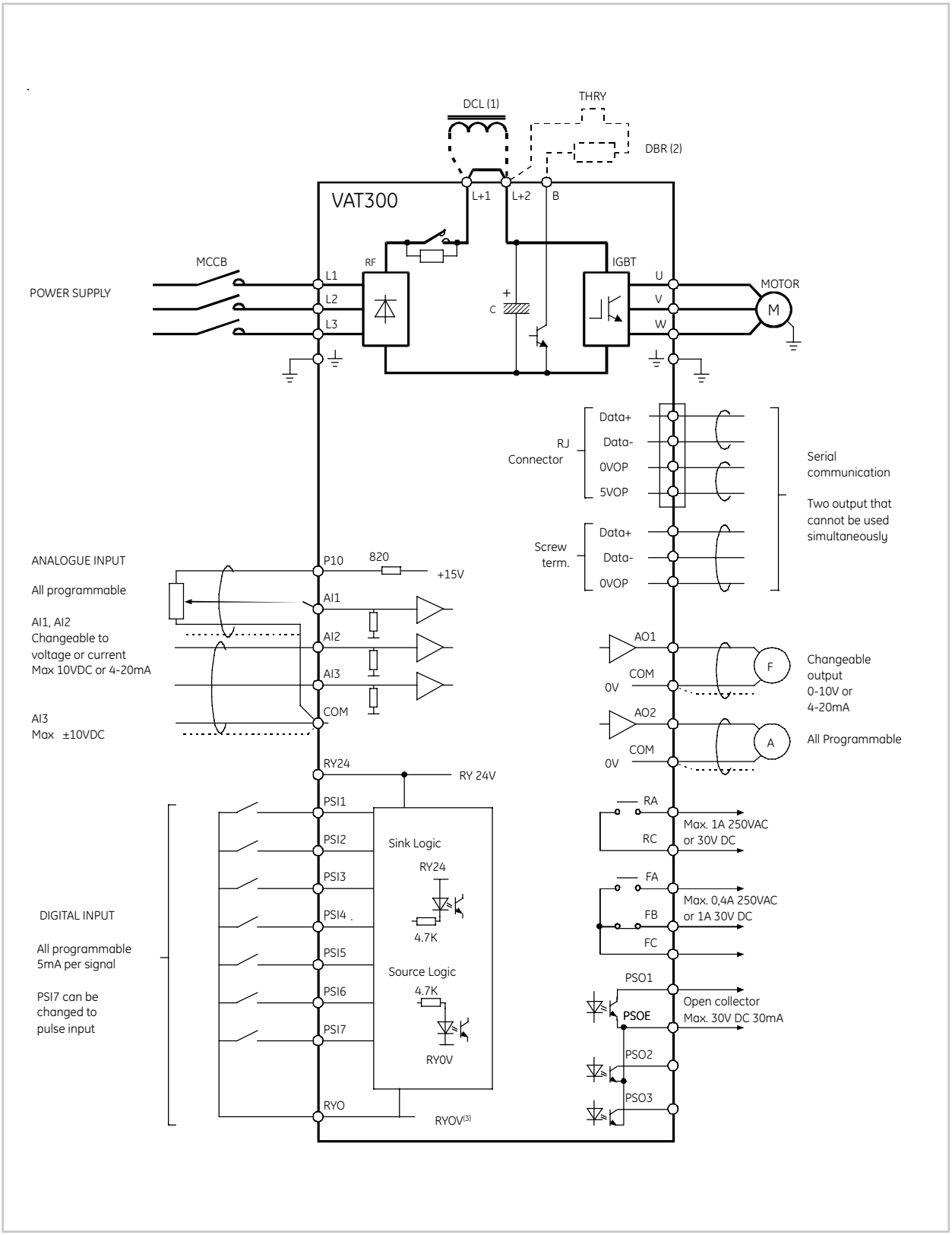
Other important functions

- Automatic start - Reverse RUN prevention - Torque limits - Multiple current limits - Adaptable V/f control - Parameter protection lock - DC braking - Cooling fan ON/OFF control	- Pre-excitation - Password protection - Parameter protection - Automatic braking on power failure - Simple speed control - Pulse train I/O function - Extended and configurable display indication	- Jog forward & reverse function - Direct and inverse PID type mode selection - S-Ramps - Multiple stop mode, all configurable, like ramp down, emergency, coast to stop, by DC injection

Protections

Motor & drive protections	- Overload independent for ND, HD - Overcurrent trip - Overcurrent limit - Overvoltage trip - Overvoltage limit - Drive overheat - Ground fault - Phase failure	- Overspeed protection - Fuse blown indication - External fault (from I/O) - Precharging circuit fault - EEPROM data Error - PM module fault - Self diagnostics for CPU, and PCBs

I/O wiring basic scheme



(1) Remove link between L+1 and L+2 when using DC reactor
(2) Built-in dynamic breaking is included up to U3SX22K0, and U3SN18K5 drives.
Use external braking devices for large units. Check user manual for details
(3) No connection should be made between RYOV and COM, due to these sections are isolated

I/O terminal board specifications

Control terminal board

	Terminals	Function	Description
Digital inputs	**RY0, RY24**	Common inputs	Common terminal for digital inputs. Available sink / source logic. RY24 and RY0 must not be shorted
	PSI1 to PSI7	Programmable inputs	These commands can be arbitrarily set to any input sequence function. Programmable with more than 50 functions. Input PSI7, can be used as pulse setting (max 10kHz)
Analogue inputs	**AI1, 2**	Programmable inputs	12 bits, programmable analogue input, for input voltage in the range of 0 to 10V or input current in the range of 0 to 20mA. Usually dedicated for speed or torque control
	AI3	Programmable input	12 bits, programmable analogue input allowing voltage input of the range of -10 to +10V
	COM	Common input	Common terminal for the analogue inputs
	P10	Source voltage	Exclusively dedicated for potentiometer source voltage of 10V, in combination with analogue inputs AI1 or AI2
Analogue outputs	**A01, A02**	Output metering	10 bits, programmable analogue outputs for metering purposes
	COM	Common	Common terminal for analogue outputs
Digital outputs	**RA, RC**	Relay (1NO)	Programmable relay to any sequence output, assigned by default to RUN function
	FA, FB, FC	Relay (1NO/NC)	Programmable relay to any sequence output, assigned by default to fault function
	PSO1 to PSO3	Transistor output	Programmable transistor outputs, assigned by default to RDY (ready), IDET (current detection) and ATN (speed reached) functions. Can be programmed with any sequence output function
	PSOE	Common	Common terminal for digital open collector transistors output

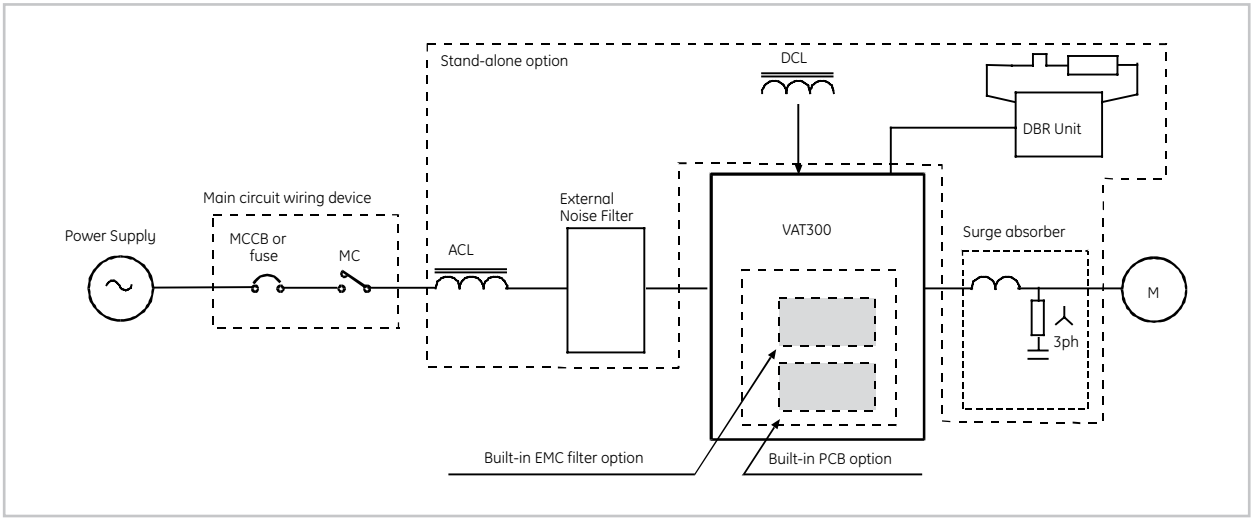
Input sequence functions (assignable to any programmable digital input)

	Symbol	Function	Description
	F RUN	Forward run	Forward run command for the remote operation mode
	EMS	Emergency stop	Cancels all run commands. The operation can be stopped with ramp deceleration stop or coast to stop. This signal can also be output as a fault (FLT) (C00-4)
	R RUN	Reverse run	Command for reverse run
	F JOG	Forward jogging	Jogging commands, with specific speed settings. Either ramp down to stop or coast to stop are available
	R JOG	Reverse jogging	
	HOLD	Hold	Used for stopping, when forward or reverse commands are operated by push buttoms
	BRAKE	DC brake	DC injection voltage to the motor can be enabled with this signal In the case of PM motor control, this function enables DC field
	RESET	Fault reset	Resets the fault state
	COP	Switch selector for serial transmission	Selects command control either from VAT300's digital inputs or from serial communication command control signals
	CSEL	Ramp selection	Selects either two acceleration/deceleration ramp settings
	I PASS	Ratio interlock bypass	Bypasses ratio interlock function
	CPASS	Ramp bypass	Bypasses acceleration or deceleration ramp function
	PIDEN	PID control selection	Enables or disables the PID function
	AFS1, 2, 3	Speed setting 1, 2 or 3	Functions used for selection of speed or torque analogue inputs
	PROG	Program function	Used for multiple setting, up to 8 speeds. Speed selection is made by sequence functions S0, S1, S2, S3, SE
	CFS	Switch selector for serial transmission	Selects speed setting either from VAT300's analogue inputs or from serial communication command signals
	S0 to S3 SE	Program setting selection	Auxiliary functions used for multi-speed operation and other purposes
	FUP, FDW	Speed Up/Down	Allows speed up and down command by push-buttons
	BUP, BDW	Ratio interlock bias Up/Down	These functions allow to increase or decrease the variable bias "C" in the ratio interlock function, Y=Ax+B+C
	IVLM	Ratio interlock bias selection	Enables or disables the ratio interlock bias function
	AUXDV	Auxiliary drive selection	Enables or disables auxiliary drive function, which allows to use a unique drive with 4 different set of motor parameters
	PICK	Pick-Up	Also called "flying start", allows to re-start a motor which is free wheel rotating
	MBRK_ans	External brake feedback	Used to input breaks ON/OFF status, from external mechanical break
	PRST	STP reset	Used to input RESET signal while running the spinning function
	S5 to S7	Digital torque bias 0 to 4	Selects either of the 5 torque bias settings
	AUXSW0, 1	Auxiliary drive no. selection L and H	Selects up to four set of parameters, for example, to use the drive with four different motors or settings
	PLS_IN	Pulse train input selection	Enables or disables the digital input PSI7, as pulse input
	OCLLV1, V2	OCL settings 1, 2	Enables or disables the two additional overcurrent limit levels
	E.FLT1 to 8	External fault	External signals to the VAT300, can be input through digital programmable inputs PSI, then to generate a fault, and to stop the drive In this case the drive stops by coast to stop only
	EXC	Pre-excitation	This provides excitation flux in the motor, before to start, in order to have immediate torque at starting time
	ACR	ACR	ACR operation is selected, to provide torque control
	PCTL	P control	ASR control is changed from the PI control to the P control
	LIM1, 2	Drive torque limiter changeovers	Enables the drive torque limiter reduction setting by the analogue input or serial transmission
	MCH	Machine time constant changeover	During ASR operation, ASR gain may be changed by this parameter switch, then select settings either from two different sets of machine time constants
	RF0	0 setting	The speed setting is changed to 0 min–1 (Zero Speed)
	DROOP	Drooping changeover	Enables drooping function, to synchronize several drives
	DEDB	Dead band setting	Sets dead band of ASR (speed regulator)
	TRQB1, 2	Torque bias set 1, 2	Enables torque bias input 1 or 2

Output sequence functions (assignable to any digital programmable output)

Symbol	Function	Description
RUN	Run	Turns ON during running, jogging or DC braking. Also can be ON during pre-excitation
FLT	Fault	Turns ON during a fault
MC	Precharge completed	Turns ON when the DC main circuit voltage reaches the required voltage after Power ON
RDY1	Ready (1)	Turns ON when there is no fault, EMS is not activated, pre-charging is complete and the encoder signal is detected (this last, only in PM motor control with sensor mode)
RDY2	Ready (2)	Turns ON when there is no fault, pre-charging is complete and the encoder signal is detected (this last only in PM motor control with sensor mode)
LCL	Local	Turns ON when the operation mode is local (operation from the keypad)
REV	Reverse run	- V/f Control: This turns ON while the output frequency is reverse running - Vector and PM control: This turns ON while the motor is reverse running
IDET	Current detection	Turns ON when the output current reaches the detection level set in the drive or higher
ATN	Frequency or speed attainment	Turns ON when the output frequency or speed reaches the reference set in the drive
SPD1, 2	Frequency or speed detection (1 or 2)	Turns ON when the output frequency or speed, reaches the value set by detection speed levels 1 or 2
COP	Transmission selection	Turns ON when serial transmission operation switch is enabled
EC0~EC3	Specific fault output	EC0 to EC3 functions, can be programmed with any of the fault events which are available in the VAT300. If one of the programmed faults occurs, then the corresponding ECx function turns ON
ACC	Acceleration	Turns ON during acceleration
DCC	Deceleration	Turns ON during deceleration
AUXDV	Auxiliary drive selection	Turns ON when the auxiliary drive parameter setting is enabled
ALM	Minor fault	Turns ON during a minor fault
FAN	Fan control	Turns ON during running, jogging, pre-excitation and DC braking. After these events, the function turns OFF with three minutes delay
ASW	Automatic start wait	When the automatic start function is used, ASW will turn ON while waiting for automatic start
ZSP	Zero speed	Turns ON when the output frequency (speed) absolute value is below the level set with zero speed (C15-4)
LL MT	PID lower limit output	Turns ON when the feedback value is below the lower limit value (<B43-4) during PID control
ULMT	PID upper limit output	Turns ON when the feedback exceeds the upper limit value (>B43-3) during PID control
Doff-End	Doff-End alarm output	Turns ON only at a specific sequence of spinning frame operation
MBRK	External brake output	Outputs an external ON/OFF signal to control an external mechanical break
DVER	Speed deviation error	Turns ON during a speed deviation error
BPF	Stoppage deceleration output	BPF turns ON when the DC voltage drops below the set value in parameter B12-1, then allowing the automatic breaking on power failure if this is enabled
RDELAY	Run delay answer	Delays the turning OFF of the sequence output RUN, according to time set on C15-5
MPO1 to 8	Multi-pump output	Output signal for multi-pump control
PLC1 to 8	Built-in PLC output	Sequence output signal of built-in PLC

External accessories



Stand-alone options

Line contactor and circuit breakers	CLxx, CKxx	MC line contactor, fuses or MCCBs (Moulded Case Circuit Breakers) must be installed to protect the installation, according either IEC or UL standards. Check application table, for selecting these devices
Noise filter	U30F_xxxxx	External filters for suppressing the electromagnetic noise generated from the drive
DB units	U2KV23DBU_xx	Dynamic braking devices. These are required to absorb the regenerative energy during fast braking, or during deceleration of high friction loads. To be used with following VAT300 drives: 400V series: From U3SX030K0 and above (30kW and above) 200V series: From U3SN022K0 and above (22kW and above) Always install the appropriate braking resistor.
DBR units	ER_xxxxx TLR_xxxx	Braking resistors, to be used in combination with external dynamic braking modules, or with VAT300 provided with built-in dynamic braking. Note VAT300 up to U3SX015K0 and up to U3SN011K0, are provided with a small capacity, built-in braking resistor as standard. When braking torque with built-in resistors is not enough, use external braking resistors. Check VAT300 user manual for technical details
ACL	ACRP_xxxxx	ACL provides significant benefits, in reducing the harmonic content, improving the power factor and reducing the ripple in the converter DC stage. In addition, ACL provides additional protection to the VAT300 against surge voltage from the mains. If the line impedance is too low, the current ripple trough converter may become excessive, current peaks too high, and this may produce permanent damage on the VAT300. Always install an ACL, (AC Input reactor), in below cases: - When mains transformer is larger than 500kVA, for VAT300 drives up to 55kW in heavy duty ratings - When mains transformer is larger than 10 times inverter capacity kVA, for drives larger than 55kW in heavy duty, or all range of VAT300 in normal duty ratings
DCL	DCRP_xxxxx	Same benefits than ACL reactors, except for surge voltage protection
Surge absorber	ACFRP_xxxxx N11P34018=7	This protection, ia a combination of output reactor ACFRP and a RC filter N11P34018=7. This is used to protect standard motors against surge voltage. It may be required for 400-480VAC systems, when the power wirings from VAT300 to the motor are larger than 40mts

VAT300 application with Normal Duty ratings

VAT300 Type	Losses W	Motor kW[1]	MCCB[2] (A)	Contac-tor	EMC filter[3]	Dynamic braking module	DBR[4]	INPUT AC reactor	DC reactor	Surge absorber[5] reactor + RC
X000K7	58	0.75	15	CL00	Built-in	Built-in	TLR864P200	ACRP3A8H1	-	ACFRP10A + RC
X001K5	72	1.5	15	CL00	Built-in	Built-in	TLR432P200	ACRP4A5H1	-	ACFRP10A + RC
X002K2	110	2.2	15	CL00	Built-in	Built-in	TLR295P200	ACRP6A3H4	-	ACFRP10A + RC
X004K0	160	4	15	CL00	Built-in	Built-in	TLR175P600	ACRP10A2H	-	ACFRP10A + RC
X005K5	210	5.5	20	CL00	Built-in	Built-in	TLR118P600	ACRP14A1H4	-	ACFRP14A + RC
X007K5	240	7.5	25	CL02	Built-in	Built-in	TLR86P600	ACRP18A1H1	DCRP25A2H1	ACFRP18A + RC
X011K0	350	11	30	CL04	Built-in	Built-in	TLR59P1000	ACRP27A0H75	DCRP32A1H6	ACFRP27A + RC
X015K0	470	15	40	CL04	Built-in	Built-in	TLR43P1000	ACRP35A0H58	DCRP40A1H2	ACFRP35A + RC
X018K5	500	18.5	50	CL04	Built-in	Built-in	TLR35P1500	ACRP38A0H58	DCRP50A0H96	ACFRP38A + RC
X022K0	610	22	60	CL06	Built-in	Built-in	TLR29P1800	ACRP45A0H45	DCRP60A0H82	ACFRP45A + RC
X030K0	800	30	80	CL06	Built-in	U2KV23DBUH3	TLR22P2500	ACRP70A0H29	DCRP80A0H58	ACFRP62A + RC
X037K0	1000	37	100	CL07	External	U2KV23DBUH3	TLR18P3000	ACRP90A0H22	DCRP100A0H49	ACFRP90A + RC
X045K0	1150	45	125	CL09	External	U2KV23DBUH4	TLR15P3700	ACRP90A0H22	DCRP125A0H40	ACFRP90A + RC
X055K0	1620	55	150	CL09	External	U2KV23DBUH4	-	ACRP115A0H18	DCRP140A0H32	ACFRP115A + RC
X075K0	1670	75	200	CK75	External	U2KV23DBUH4	-	ACRP160A0H14	DCRP180A0H25	ACFRP160A + RC
X090K0	2300	90	225	CK08	External	U2KV23DBUH4	-	ACRP185A0H11	DCRP210A0H25	ACFRP185A + RC
X110K0	2860	110	300	CK85	External	U2KV23DBUH4	-	ACRP225A0H096	DCRP270A0H18	ACFRP300A + RC
X132K0	3130	132	350	CK09	External	U2KV23DBUH4	-	ACRP300A0H067	DCRP310A0H14	ACFRP300A + RC
X160K0	4110	160	400	CK09	External	U2KV23DBUH4	-	ACRP360A0H056	DCRP400A0H13	ACFRP360A + RC
X200K0	6560	200	500	CK95	External	U2KV23DBUH4	-	ACRP460A0H056	DCRP540A0H08	ACFRP460A + RC
X250K0	8050	250	600	CK10	External	2xU2KV23DBUH4	-	ACRP550A0H039	DCRP650A0H07	ACFRP550A + RC
X315K0	9500	315	800	CK11	External	2xU2KV23DBUH4	-	ACRP700A0H035	DCRP740A0H06	ACFRP700A + RC
X400K0	12140	400	1000	CK12	External	2xU2KV23DBUH4	-	ACRP850A0H023	DCRP950A0H05	ACFRP850A + RC
X475K0	14370	475	1200	CK13	External	3xU2KV23DBUH4	-	ACRP950A0H016	DCRP1000A0H04	ACFRP950A + RC
N000K7	65	0.75	15	CL00	Built-in	Built-in	TLR216P200	ACRP6A2H5	-	-
N001K5	92	1.5	15	CL00	Built-in	Built-in	TLR108P200	ACRP9A1H3	-	-
N002K2	130	2.2	15	CL00	Built-in	Built-in	TLR74P200	ACRP12A0H84	-	-
N004K0	160	4	20	CL01	Built-in	Built-in	TLR44P600	ACRP18A0H56	-	-
N005K5	230	5.5	30	CL02	Built-in	Built-in	TLR29P600	ACRP27A0H37	-	-
N007K5	350	7.5	40	CL04	External	Built-in	TLR22P600	ACRP35A0H27	DCRP45A0H55	-
N011K0	440	11	60	CL04	External	Built-in	TLR15P1000	ACRP55A0H18	DCRP60A0H4	-
N015K0	510	15	80	CL06	External	Built-in	TLR11P1200	ACRP70A0H14	DCRP80A0H3	-
N018K5	710	18.5	100	CL07	External	Built-in	TLR8,8P1500	ACRP80A0H14	DCRP100A0H24	-
N022K0	700	22	125	CL09	External	U2KV23DBUL2	TLR7,4P1800	ACRP97A0H11	DCRP120A0H2	-
N030K0	930	30	150	CL10	External	U2KV23DBUL3	TLR5P2500	ACRP140A0H072	DCRP150A0H17	-
N037K0	1210	37	200	CK75	External	U2KV23DBUL3	TLR4P3000	ACRP180A0H056	DCRP180A0H14	-
N045K0	1480	45	225	CK75	External	U2KV23DBUL4	-	ACRP200A0H051	DCRP220A0H11	-

(1) Device selection conditions, for Normal Duty (overload capacity 120%, 60s).
(2) Fuses or MCCB given are for IEC ratings.
When complying with UL/cUL, use a UL certified fuse as indicated in section 9-1 of VAT300 user manual.
(3) Built-in EMC filters only in specified ratings and for drives U3SNxxxxxFxx or U3SXxxxxxFxx. For drives without built-in filter, or larger than U3SN005K5 or U3SX030K0, select an external EMC filter from tables on page H.31.
(4) External braking resistors for optimal performance. Note drives up to U3SN011K0 and U3SX11K0 include a built-in braking resistor, which should be disconnected when using the external braking resistors. Check 7-3-1 section of VAT300 user manual.
(5) The surge absorber - useful when length of motor cable is more than 40mts. It is configured using the output reactor shown in above table plus RC filter, N11P34018=7 (Set VAT300 with carrier frequency of 1kHz).

VAT300 application with Heavy Duty ratings

VAT300 Type	Losses W	Motor kW[1]	MCCB[2] (A)	Contac-tor	EMC filter[3]	Dynamic braking module	DBR[4]	INPUT AC reactor	DC reactor	Surge absorber[5] reactor + RC
X000K7	53	0.4	15	CL00	Built-in	Built-in	TLR864P200	ACRP3A8H1	-	ACFRP10A + RC
X001K5	65	0.75	15	CL00	Built-in	Built-in	TLR864P200	ACRP3A8H1	-	ACFRP10A + RC
X002K2	90	1.5	15	CL00	Built-in	Built-in	TLR432P200	ACRP4A5H1	-	ACFRP10A + RC
X004K0	120	2.2	15	CL00	Built-in	Built-in	TLR295P200	ACRP6A3H4	-	ACFRP10A + RC
X005K5	170	4	15	CL00	Built-in	Built-in	TLR175P600	ACRP10A2H	-	ACFRP10A + RC
X007K5	230	5.5	20	CL00	Built-in	Built-in	TLR118P600	ACRP14A1H4	DCRP18A2H9	ACFRP14A + RC
X011K0	300	7.5	25	CL02	Built-in	Built-in	TLR86P600	ACRP18A1H1	DCRP25A2H1	ACFRP18A + RC
X015K0	400	11	35	CL04	Built-in	Built-in	TLR59P1000	ACRP27A0H75	DCRP32A1H6	ACFRP27A + RC
X018K5	460	15	50	CL04	Built-in	Built-in	TLR43P1000	ACRP35A0H58	DCRP40A1H2	ACFRP35A + RC
X022K0	550	18.5	60	CL04	Built-in	Built-in	TLR35P1500	ACRP38A0H58	DCRP50A0H96	ACFRP38A + RC
X030K0	620	22	70	CL06	Built-in	U2KV23DBUH2	TLR29P1800	ACRP45A0H45	DCRP60A0H82	ACFRP45A + RC
X037K0	860	30	80	CL06	External	U2KV23DBUH3	TLR22P2500	ACRP70A0H29	DCRP80A0H58	ACFRP62A + RC
X045K0	930	37	100	CL07	External	U2KV23DBUH3	TLR18P3000	ACRP90A0H22	DCRP100A0H49	ACFRP90A + RC
X055K0	1260	45	125	CL09	External	U2KV23DBUH4	TLR15P3700	ACRP115A0H18	DCRP125A0H40	ACFRP115A + RC
X075K0	1190	55	150	CK75	External	U2KV23DBUH4	-	ACRP115A0H18	DCRP140A0H32	ACFRP115A + RC
X090K0	1830	75	200	CK08	External	U2KV23DBUH4	-	ACRP160A0H14	DCRP180A0H25	ACFRP160A + RC
X110K0	2280	90	225	CK85	External	U2KV23DBUH4	-	ACRP185A0H11	DCRP210A0H25	ACFRP185A + RC
X132K0	2600	110	300	CK09	External	U2KV23DBUH4	-	ACRP225A0H096	DCRP270A0H18	ACFRP225A + RC
X160K0	3200	132	350	CK09	External	U2KV23DBUH4	-	ACRP300A0H067	DCRP310A0H14	ACFRP300A + RC
X200K0	4750	160	400	CK95	External	U2KV23DBUH4	-	ACRP360A0H056	DCRP400A0H13	ACFRP360A + RC
X250K0	6350	200	500	CK10	External	U2KV23DBUH4	-	ACRP460A0H056	DCRP540A0H08	ACFRP460A + RC
X315K0	7880	250	700	CK11	External	2xU2KV23DBUH4	-	ACRP550A0H039	DCRP650A0H07	ACFRP550A + RC
X400K0	9300	315	800	CK12	External	2xU2KV23DBUH4	-	ACRP700A0H035	DCRP740A0H06	ACFRP700A + RC
X475K0	11860	400	1000	CK13	External	2xU2KV23DBUH4		ACRP850A0H023	DCRP950A0H05	ACFRP850A + RC
N000K7	55	0.4	15	CL00	Built-in	Built-in	TLR405P200	ACRP4A2H5	-	-
N001K5	69	0.75	15	CL00	Built-in	Built-in	TLR216P200	ACRP6A2H5	-	-
N002K2	110	1.5	15	CL00	Built-in	Built-in	TLR108P200	ACRP9A1H3	-	-
N004K0	130	2.2	20	CL00	Built-in	Built-in	TLR74P200	ACRP12A0H84	-	-
N005K5	190	4	30	CL01	Built-in	Built-in	TLR44P600	ACRP18A0H56	-	-
N007K5	320	5.5	35	CL02	External	Built-in	TLR29P600	ACRP27A0H37	DCRP32A0H78	-
N011K0	400	7.5	50	CL04	External	Built-in	TLR22P600	ACRP35A0H27	DCRP45A0H55	-
N015K0	450	11	70	CL04	External	Built-in	TLR15P1000	ACRP55A0H18	DCRP60A0H4	-
N018K5	550	15	90	CL06	External	Built-in	TLR11P1200	ACRP70A0H14	DCRP80A0H3	-
N022K0	610	18.5	125	CL07	External	U2KV23DBUL2	TLR8,8P1500	ACRP80A0H14	DCRP100A0H24	-
N030K0	690	22	125	CL09	External	U2KV23DBUL2	TLR7,4P1800	ACRP97A0H11	DCRP120A0H2	-
N037K0	950	30	150	CL10	External	U2KV23DBUL3	TLR5P2500	ACRP140A0H072	DCRP150A0H17	-
N045K0	1150	37	200	CK75	External	U2KV23DBUL3	TLR4P3000	ACRP180A0H056	DCRP180A0H14	-

(1) Device selection conditions for heavy duty (overload capacity 150%, 60s).
(2) Fuses or MCCB given are for IEC ratings.
When complying with UL/cUL, use a UL certified fuse as indicated in section 9-1 of VAT300 user manual.
(3) Built-in EMC filters only in specified ratings and for drives U3SNxxxxxFxx or U3SXxxxxxFxx. For drives without built-in filter, or larger than U3SN005K5 or U3SX030K0, select an external EMC filter from tables on page H.31.
(4) External braking resistors for optimal performance. Note drives up to U3SN011K0 and U3SX11K0 include a built-in braking resistor, which should be disconnected when using the external braking resistors. Check 7-3-1 section of VAT300 user manual.
(5) The surge absorber - useful when length of motor cable is more than 40mts. It is configured using the output reactor shown in above table plus RC filter, N11P34018=7 (Set VAT300 with carrier frequency of 1kHz).

Dimensional drawings and weights

Drives

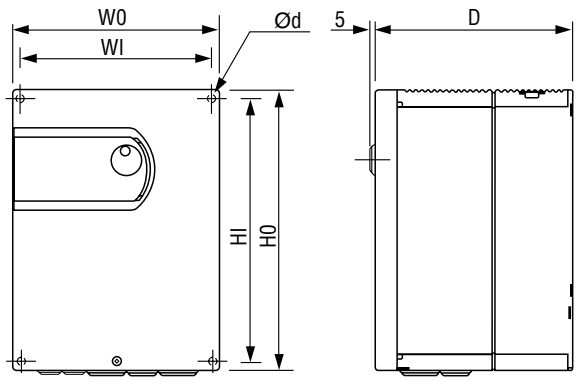


Fig. 1

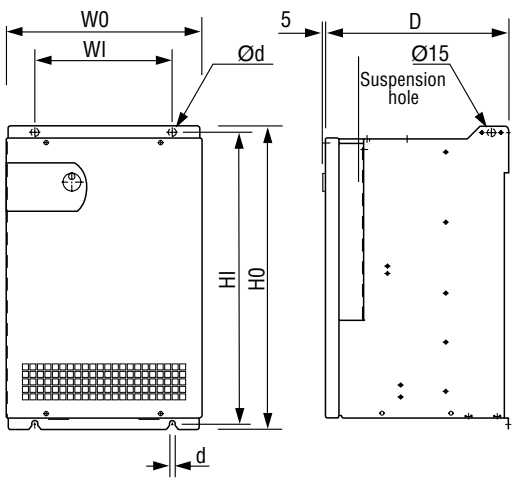


Fig. 2

200V Series: N000K7 to N045K0.
400V Series: X000K7 to X055K0

Type		Dimensions (mm)						Main circuit terminal	Weight (kg)	Fig.
200V Series	400V Series	W0	W1	H0	H1	D	ød			
N000K7 N001K5 N002K2 N004K0 N005K5	X000K7 X001K5 X002K2 X004K0 X005K5	155	140	250	235	180	6	M4	3	1
	X007K5 X011K0	205	190	275	260	196	7		5	
N007K5 N011k0	X015K0							M5		
	X018K0 X022K0	260	240	350	330	298			12	
N015K0	X030K0							M6		
N018K5										
N022K0 N030K0	X037K0 X045K0	300	200	470	450	317	10	M8	23	2
	X055K0								27	
N037K0 N045K0		340	240	520	500			M10	30	

Dimensional drawings and weights

Drives

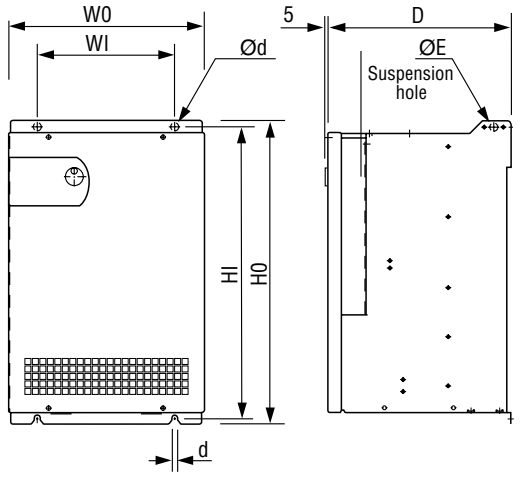


Fig. 3

400V Series: X075K0 to X475K0

Type	Dimensions (mm)							Main circuit terminal	Weight (kg)	Fig.
400V Series	W0	W1	H0	H1	D	ød	øE			
X075K0	435	300	615	595	350	10	20	M10	42	3
X090K0									45	
X110K0	500	400	710	684					60	
X132K0									65	
X160K0	580	400	1020	990	470	13	23		90	
X200K0									100	
X250K0	580	400	1260	1230		15	23	M16	200	
X315K0	870	600	1260	1230					285	
X400K0									290	
X475K0									295	

EMC Filters

EMC compliance for VAT300 is achieved either by built-in filters in the drive or by external filters. Built-in filters are available for drives up to 30kW/400V (U30SX030K0_) only. For larger drives, an external EMI filter should be used when compliance with EMC is required. Check the tables below to select the filter according to the inverter type.

VAT300 Drives with built-in filter

VAT300 Series	VAT300 Model	Second environment EN61800-3 category C3	First environment EN61800-3 category C2
		Filter type	Add ferrite cores[1]
200V Series with built-in filter	U3SN000K7F__	Built-in	P:ZCAT3035-1330×3 C:ZCAT3035-1330×1 M:ZCAT3035-1330×1
	U3SN001K5F__		
	U3SN002K2F__		
	U3SN004K0F__		NA
	U3SN005K5F__		
400V Series with built-in filter	U3SX000K7F__	Built-in	P:ZCAT3035-1330×3 C:ZCAT3035-1330×1 M:ZCAT3035-1330×1
	U3SX001K5F__		
	U3SX002K2F__		
	U3SX004K0F__		
	U3SX005K5F__		
	U3SX007K5F__	Built-in	NA
	U3SX011K0F__		
	U3SX015K0F__		
	U3SX018K5F__		
	U3SX022K0F__		
	U3SX030K0F__		

(1) P: Ferrite cores for power cable
C: Ferrite cores for control cable
M: Ferrite cores for motor cable

External filters for VAT300 drives without built-in Filter (200V series)

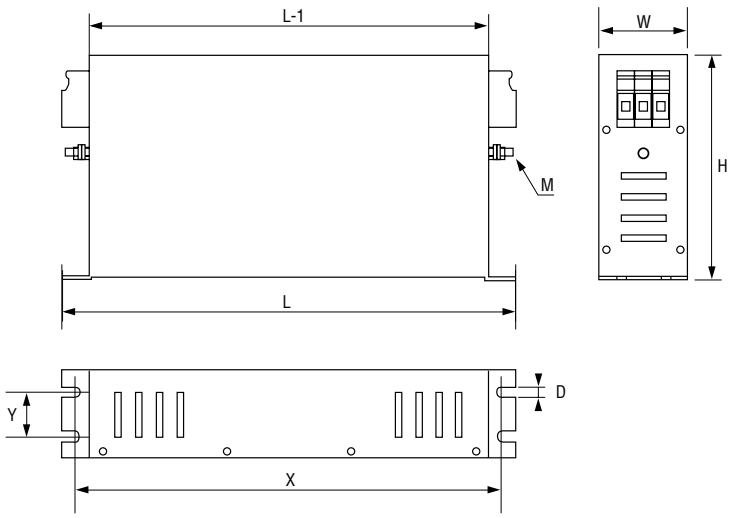
VAT300 Series	VAT300 Model	Second environment (EN61800-3 category C3) External filter selection	
		Use with VAT300 in ND	Use with VAT300 in HD
200V Series	U3SN000K7S__	U30F3016EB	U30F3016EB
	U3SN001K5S__	U30F3016EB	U30F3016EB
	U3SN002K2S__	U30F3016EB	U30F3016EB
	U3SN004K0S__	U30F3030EB	U30F3030EB
	U3SN005K5S__	U30F3030EB	U30F3030EB
	U3SN007K5S__	U30F3075EB	U30F3075EB
	U3SN011K0S__	U30F3075EB	U30F3075EB
	U3SN015K0S__	U30F3100EB	U30F3100EB
	U3SN018K5S__	U30F3100EB	U30F3100EB
	U3SN022K0S__	U30F3130EB	U30F3130EB
	U3SN030K0S__	U30F3180EB	U30F3180EB
	U3SN037K0S__	U30F3250ES	U30F3250ES
	U3SN045K0S__	U30F3250ES	U30F3250ES

External filters for VAT300 drives without built-in filter (400V series)

VAT300 Series	VAT300 Model	Second environment (EN61800-3 category C3) External filter selection	
		Use with VAT300 in ND	Use with VAT300 in HD
400V Series	U3SX000K7S__	U30F3016EB	U30F3016EB
	U3SX001K5S__	U30F3016EB	U30F3016EB
	U3SX002K2S__	U30F3016EB	U30F3016EB
	U3SX004K0S__	U30F3016EB	U30F3016EB
	U3SX005K5S__	U30F3030EB	U30F3030EB
	U3SX007K5S__	U30F3030EB	U30F3030EB
	U3SX011K0S__	U30F3030EB	U30F3030EB
	U3SX015K0S__	U30F3055EB	U30F3055EB
	U3SX018K5S__	U30F3055EB	U30F3055EB
	U3SX022K0S__	U30F3075EB	U30F3075EB
	U3SX030K0S__	U30F3100EB	U30F3100EB
	U3SX037K0S__	U30F3100EB	U30F3100EB
	U3SX045K0S__	U30F3130EB	U30F3130EB
	U3SX055K0S__	U30F3180EB	U30F3180EB
	U3SX075K0S__	U30F3250ES	U30F3180EB
	U3SX090K0S__	U30F3250ES	U30F3250ES
	U3SX110K0S__	U30F3320ES	U30F3320ES
	U3SX132K0S__	U30F3400ES	U30F3320ES
	U3SX160K0S__	U30F3600ES	U30F3400ES
	U3SX200K0S__	U30F3600ES	U30F3600ES
	U3SX250K0S__	U30F31000ES	U30F3600ES
	U3SX315K0S__	U30F31000ES	U30F31000ES
	U3SX400K0S__	U30F31000ES	U30F31000ES
	U3SX475K0S__	U30F31600ES	U30F31000ES

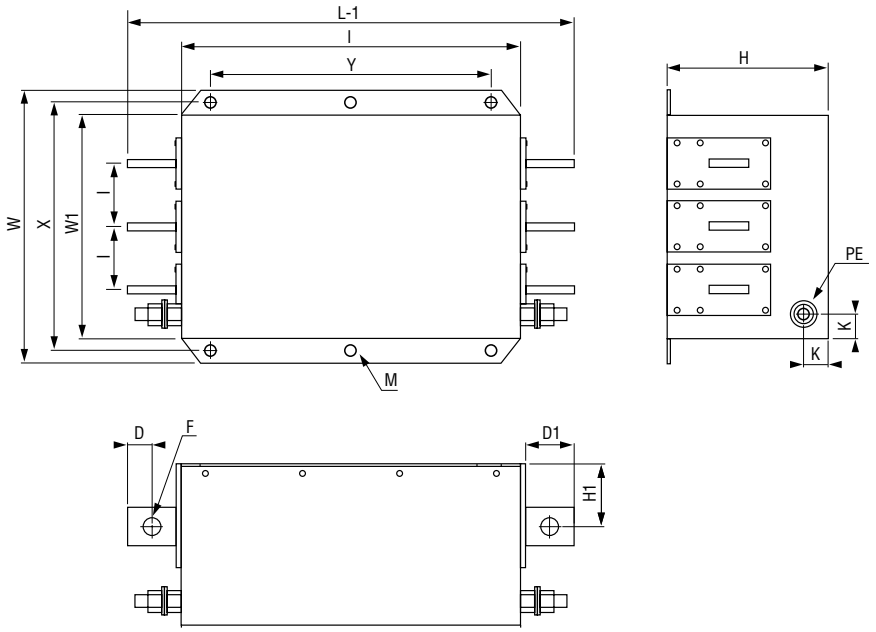
Dimensional drawings and weights

External filter book case type



Cat. no.	Ref. no.	Dimensions								Weight (kg)
		L	L-1	H	W	X	Y	M	D	
U30F3016EB	129284	250	220	70	45	235	25	M5	M5	1.7
U30F3030EB	129285	270	240	85	50	255	30	M5	M5	1.8
U30F3055EB	129286	250	220	90	85	235	60	M6	M5	3.1
U30F3075EB	129287	270	240	135	80	255	60	M6	M6	4
U30F3100EB	129288	270	240	150	90	255	65	M10	M6	5.5
U30F3130EB	129289	270	240	150	90	255	65	M10	M6	7.5
U30F3180EB	129290	380	350	170	120	365	102	M10	M6	11

External filter brick case type



Cat. no.	Ref. no.	Dimensions															Weight (kg)
		W	W1	X	L	L1	Y	H	H1	K	M	D	D1	F	I	PE	
U30F3250ES	129291	190	140	165	300	392	240	116	41	20	Ø12	15	42	Ø11	40	M10	7
U30F3320ES	129292	260	210	235	300	392	240	116	41	20	Ø12	15	42	Ø11	60	M10	10.3
U30F3400ES	129293	260	210	235	300	392	240	116	41	20	Ø12	15	42	Ø11	60	M10	10.3
U30F3600ES	129294	260	210	235	300	392	240	116	48,5	20	Ø12	15	42	Ø11	60	M10	11
U30F31000ES	129295	280	230	255	350	460	290	166	64	25	Ø12	25	50	Ø17	65	M12	18
U30F31600ES	129296	300	250	275	400	592	340	166	61	25	Ø12	25	52	Ø17	80	M12	27

External dynamic braking units

VAT300 includes a built-in dynamic braking feature as standard, in drives up to U3SX022K0 and up to U3SX18K5.
For larger drives the dynamic braking is achieved by using the external dynamic braking device U2KV23DBU__

Fig. 1

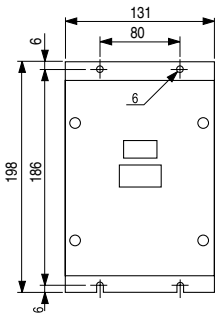
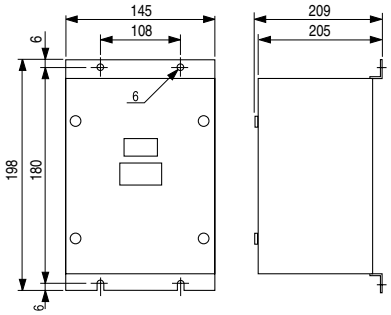


Fig. 2



Cat. no.	Ref. no.	Fig.	Weight (kg)
U2KV23DBUL1	168098	1	1,7
U2KV23DBUL2	168099	1	1,7
U2KV23DBUL3	168100	1	1,7
U2KV23DBUH1	168084	1	1,7
U2KV23DBUH2	168085	1	1,7
U2KV23DBUH3	168086	1	1,7
U2KV23DBUH4	168083	2	3,5

Braking resistors

A small capacity braking resistor is included in drives up to U3SX015K0 and up to U3SN011K0 as standard. Check VAT300 user manual for technical details.

For larger drives, or when braking torque with Built-in resistors, is not enough, use external braking resistors.

The external braking optional resistors for 100% braking capacity, 10% ED are shown in below table:

Fig. 1
Resistors with terminals for

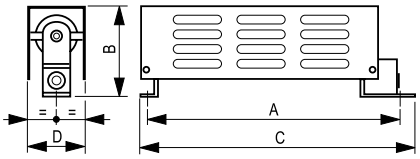
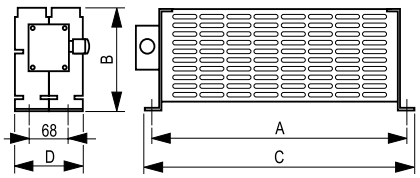


Fig. 2
Resistors with terminals for



Cat. no.	Ref. no.	Fig.	Dimensions (mm)				Weight (kg)
			A	B	C	D	
TLR405P200	129867	1	195	65	210	60	0.6
TLR216P200	129868	1	195	65	210	60	0.6
TLR108P200	129869	1	195	65	210	60	0.6
TLR74P200	129870	1	195	65	210	60	0.6
TLR44P600	129166	1	450	95	465	60	1.2
TLR29P600	129167	1	450	95	465	60	1.2
TLR22P600	129168	1	450	95	465	60	1.2
TLR15P1000	129169	1	450	100	465	70	1.8
TLR11P1200	129170	1	450	120	465	75	2.4
TLR8,8P1500	129171	2	440	100	460	140	2.2
TLR7,4P1800	129172	2	440	100	460	140	3.4
TLR5P2500	129871	2	440	180	460	140	3.2
TLR4P3000	129872	2	440	180	460	140	5.5
TLR864P200	129873	1	195	65	210	60	0.6
TLR432P200	129875	1	195	65	210	60	0.6
TLR295P200	129876	1	195	65	210	60	0.6
TLR175P600	129173	1	450	95	465	60	1.2
TLR118P600	129174	1	450	95	465	60	1.2
TLR86P600	129175	1	450	95	465	60	1.2
TLR59P1000	129176	1	450	100	465	70	1.8
TLR43P1000	129177	1	450	100	465	70	1.8
TLR35P1500	129877	2	440	100	460	140	2.2
TLR29P1800	129878	2	440	100	460	140	3.4
TLR22P2500	129879	2	440	180	460	140	3.2
TLR18P3000	129880	2	440	180	460	140	5.5
TLR15P3700	129881	2	440	180	460	140	5.8

Dimensional drawings and weights

AC input reactors

Fig. 1

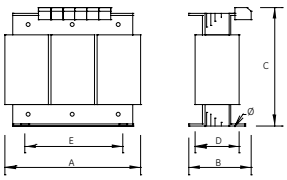
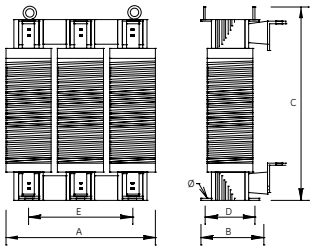


Fig. 3



Cat. no.	Ref. no.	Losses W	Fig.	Dimensions (mm)						Weight (kg)
				A	B	C	D	E	Ø	
ACRP4A2H5	168495	16	1	120	80	152	41	100	6	1,3
ACRP6A2H5	168496	18	1	120	80	152	41	100	6	1,5
ACRP9A1H3	168497	17	1	120	80	152	41	100	6	1,6
ACRP12A0H84	168498	18	1	120	80	152	41	100	6	1,7
ACRP18A0H56	168499	21	1	120	90	152	51	100	6	2,4
ACRP27A0H37	168500	32	1	150	95	183	46	125	6	3,3
ACRP35A0H27	168501	35	1	150	95	183	46	125	6	3,7
ACRP55A0H18	168502	42	1	150	110	183	61	125	6	5,5
ACRP70A0H14	168503	100	1	150	111	250	77	100	9	5,6
ACRP80A0H14	168504	108	1	150	121	250	87	100	9	7,1
ACRP97A0H11	168505	124	1	150	126	250	92	100	9	7,8
ACRP140A0H072	168506	155	3	180	166	216	92	120	9	11,9
ACRP180A0H056	168507	175	3	180	176	216	102	120	9	14,2
ACRP200A0H051	168508	210	3	180	186	216	112	120	9	15,9
ACRP3A8H1	168509	17	1	120	80	152	41	100	6	1,4
ACRP4A5H1	168510	16	1	120	80	152	41	100	6	1,5
ACRP6A3H4	168511	19	1	120	80	152	41	100	6	1,7
ACRP10A2H	168512	23	1	120	90	152	51	100	6	2,5
ACRP14A1H4	168513	29	1	150	95	178	46	125	6	3,2
ACRP18A1H1	168514	35	1	150	95	178	46	125	6	4
ACRP27A0H75	168515	77	1	150	106	233	72	100	9	4,8
ACRP35A0H58	168516	98	1	150	111	233	77	100	9	5,5
ACRP38A0H58	168517	96	1	150	116	233	82	100	9	6,4
ACRP45A0H45	168518	102	1	150	121	233	87	100	9	7,1
ACRP70A0H29	168519	147	1	150	151	250	117	100	9	11
ACRP90A0H22	168520	158	1	180	136	286	102	120	9	13,1
ACRP115A0H18	168521	186	1	180	156	301	122	120	9	16,9
ACRP160A0H14	168522	268	3	240	181	288	107	160	9	25,7
ACRP185A0H11	168523	255	3	240	181	288	107	160	9	26,3
ACRP225A0H096	168524	305	3	240	191	288	117	160	9	30,7
ACRP300A0H067	168525	356	3	240	226	288	142	160	9	40,4
ACRP360A0H056	168526	425	3	240	226	288	142	160	9	42,2
ACRP460A0H056	168527	595	3	300	258	400	142	200	9	64,1
ACRP550A0H039	168528	636	3	300	258	400	142	200	9	64,9
ACRP700A0H035	168530	991	3	360	316	472	202	300	11	116,2
ACRP850A0H023	168531	856	3	420	296	544	178	350	11	115
ACRP950A0H016	168532	934	3	420	306	544	188	350	11	123,6

DC reactors

Fig. 5

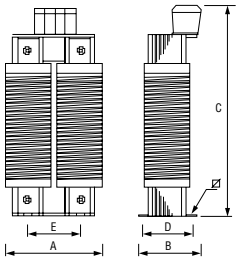
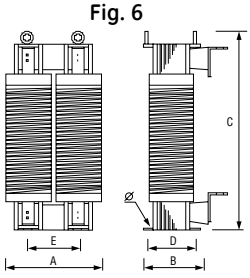


Fig. 6



Cat. no.	Ref. no.	Losses W	Fig.	Dimensions (mm)						Weight (kg)
				A	B	C	D	E	Ø	
DCRP32A0H78	168542	37	5	100	110	173	91	75	6	3,9
DCRP45A0H55	168543	33	5	120	110	203	86	90	6	6,1
DCRP60A0H4	168544	41	5	120	120	220	96	90	6	6,4
DCRP80A0H3	168545	45	5	120	135	220	111	90	6	7,1
DCRP100A0H24	168546	51	5	120	135	235	111	90	6	7,1
DCRP120A0H2	168547	43	5	160	150	285	130	120	9	13,4
DCRP150A0H17	168548	50	5	160	160	285	140	120	9	15
DCRP180A0H14	168549	263	6	160	156	288	82	120	9	11,6
DCRP220A0H11	168550	286	6	160	161	288	87	120	9	12,9
DCRP18A2H9	168555	42	5	100	95	178	76	75	6	3,5
DCRP25A2H1	168556	54	5	100	95	183	76	75	6	3,5
DCRP32A1H6	168557	59	5	100	110	183	91	75	6	3,9
DCRP40A1H2	168558	56	5	100	110	183	91	75	6	3,9
DCRP50A0H96	168559	60	5	120	110	209	86	90	6	6,1
DCRP60A0H82	168560	65	5	120	120	226	96	90	6	6,4
DCRP80A0H58	168561	58	5	120	135	226	111	90	6	7,1
DCRP100A0H49	168562	91	5	120	135	241	111	90	6	7,1
DCRP125A0H40	168563	79	5	160	150	293	130	120	9	13,4
DCRP140A0H32	168564	74	5	160	150	293	130	120	9	3,9
DCRP180A0H25	168565	332	6	160	186	288	112	120	9	18,3
DCRP210A0H25	168566	479	6	160	216	288	142	120	9	24,2
DCRP270A0H18	168567	452	6	160	226	288	152	120	9	27,7
DCRP310A0H14	168568	542	6	160	246	288	162	120	9	29,8
DCRP400A0H13	168569	677	6	200	231	400	147	150	9	40,9
DCRP540A0H08	168570	756	6	200	251	400	157	150	9	45,7
DCRP650A0H07	168571	840	6	200	281	400	177	150	9	56,2
DCRP740A0H06	168572	941	6	200	296	400	192	150	9	61,6
DCRP950A0H05	168574	810	6	240	356	472	252	180	11	99,3
DCRP1000A0H04	168575	800	6	240	366	472	262	180	11	103,1

Surge absorber

ACFR reactors

Fig. 1

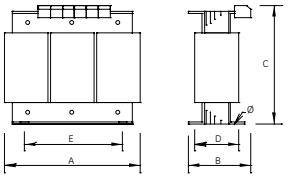
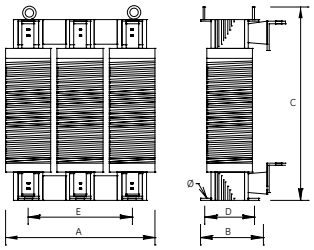
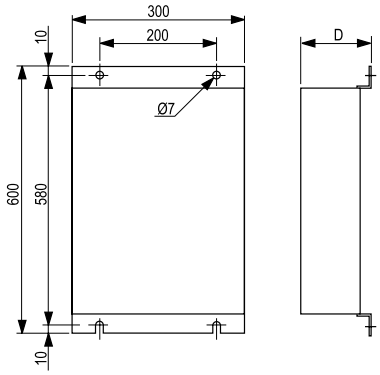


Fig. 3



Cat. no.	Ref. no.	Losses W	Fig.	Dimensions (mm)						Weight (kg)
				A	B	C	D	E	Ø	
ACFRP10A	168576	16	1	120	80	152	41	100	6	1,2
ACFRP14A	168577	15	1	120	80	152	41	100	6	1,2
ACFRP18A	168578	17	1	120	80	152	41	100	6	1,2
ACFRP27A	168579	18	1	120	80	157	41	100	6	1,4
ACFRP35A	168580	21	1	120	90	157	51	100	6	2,2
ACFRP38A	168581	21	1	120	90	157	51	100	6	2,2
ACFRP45A	168582	33	1	150	110	183	67	125	6	4,1
ACFRP62A	168583	66	1	150	101	250	67	100	9	4,2
ACFRP90A	168584	84	1	150	121	250	87	100	9	7,5
ACFRP115A	168585	112	1	180	131	299	97	120	9	12,1
ACFRP160A	168586	183	3	180	211	216	137	120	9	21,1
ACFRP185A	168587	218	3	240	181	288	107	160	9	25,5
ACFRP225A	168588	304	3	240	216	288	142	160	9	36,6
ACFRP300A	168589	477	3	300	231	400	147	200	9	59,3
ACFRP360A	168590	593	3	300	266	400	182	200	9	78,3
ACFRP460A	168591	728	3	360	308	472	212	300	11	122,4
ACFRP550A	168592	863	3	360	338	472	242	300	11	145,8
ACFRP700A	168594	1486	3	420	371	544	273	350	11	209,7
ACFRP850A	168595	1104	3	480	446	616	328	400	11	336,3
ACFRP950A	168596	1267	3	480	476	616	358	400	11	377

RC filter



Cat. no.	Ref. no.	Losses (W)	Max carrier frequency	Dimensions D	Weight (kg)
N11P3401806	168260	1470	4	275	14
N11P3401806	168261	297	1	135	8

REGIONAL OFFICES BRANCH OFFICES

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